

ESCAPE

FROM THE PLANET OF THE

ROBOT MONSTERS™


UNIVERSAL KIT

Installation Instructions

with Schematic Diagrams



ATARI®
GAMES



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UNITED STATES

Atari Games Corporation
California Customer Service Office
737 Sycamore Drive
P.O. Box 361110
Milpitas, CA 95035

Fax (408) 434-3945

Telex 5101007850

☎ (408) 434-3950

(Monday-Friday, 7:30 a.m.-4:00 p.m. Pacific time)

EUROPE

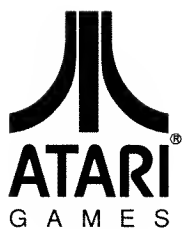
Atari Games Ireland Limited
European Customer Service Office
Tipperary Town, Ireland

Fax 062-51702

Telex 70665

☎ 062-52155

(Monday-Friday, 9:00 a.m.-5:30 p.m. GMT)



Kit Installation Instructions

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Technical Writing: Rosalind Hutton
Editing and Design: Andrea Dencker
Illustration: Mary Ohanessian Sumner

Notice Regarding Non-Atari® Parts

WARNING

Use of non-Atari parts or modifications of any Atari game circuitry may adversely affect the safety of your game, and may cause injury to you and your players.

You may void the game warranty (printed on the inside back cover of this manual) if you do any of the following:

- Substitute non-Atari parts in the game.
- Modify or alter any circuits in the game by using kits or parts *not* supplied by Atari Games Corporation.

NOTE

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of Federal Communications Commission (FCC) Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area or modification to this equipment is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference. If you suspect interference from an Atari game at your location, check the following:

- All ground wires in the game are properly connected as shown in the game wiring diagram.
- The power cord is properly plugged into a grounded three-wire outlet.
- On games provided with an Electromagnetic Interference (EMI) ground cage, be sure that the game printed-circuit boards (PCBs) are properly installed on the EMI ground cage and that the end board is securely installed with **all** screws in place and tightened.

If you are still unable to solve the interference problem, please contact Customer Service at Atari Games Corporation. See the inside front cover of this manual for service in your area.

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Safety Summary

The following safety precautions apply to all game operators and service personnel. Specific warnings and cautions will be found in this manual whenever they apply.

WARNING

Properly Ground the Game. Players may receive an electrical shock if this game is not properly grounded! To avoid electrical shock, do not plug in the game until it has been inspected and properly grounded. This game should only be plugged into a grounded three-wire outlet. If you have only a two-wire outlet, we recommend you hire a licensed electrician to install a three-wire grounded outlet. If the control panel is not properly grounded, players may receive an electrical shock! After servicing any part on the control panel, check that the grounding wire is firmly secured to the inside of the control panel. After you have checked this, lock up the game.

AC Power Connection. Before you plug in the game, be sure that the game's power supply can accept the AC line voltage in your location. The line voltage requirements are listed in the first chapter of this manual.

Disconnect Power During Repairs. To avoid electrical shock, disconnect the game from the AC power before removing or repairing any part of the game. If you remove or repair the video display, be very careful to avoid electrical shock. High voltages continue to exist even after power is disconnected in the display circuitry and the cathode-ray tube (CRT). Do not touch the internal parts of the display with your hands or with metal objects! Always discharge the high voltage from the CRT before servicing it. Do this after you disconnect it from the power source. First, attach one end of a large, well-insulated, 18-gauge jumper wire to ground. Then momentarily touch the free end of the grounded jumper wire to the CRT anode by sliding the wire under the anode cap. Wait two minutes and do this again.

Use Only Atari Parts. To maintain the safety of your Atari game, use only Atari parts when you repair it. Using non-Atari parts or modifying the game circuitry

may be dangerous, and could injure you and your players.

Handle the CRT With Care. If you drop the CRT and it breaks, it may implode! Shattered glass from the implosion can fly six feet or more.

Use the Proper Fuses. To avoid electrical shock, use replacement fuses which are specified in the parts list for this game. Replacement fuses must match those replaced in fuse type, voltage rating, and current rating. In addition, the fuse cover must be in place during game operation.

CAUTION

Properly Attach All Connectors. Make sure that the connectors on each printed circuit board (PCB) are properly plugged in. The connectors are keyed to fit only one way. If they do not slip on easily, do not force them. If you reverse a connector, it may damage your game and void your warranty.

Ensure the Proper AC Line Frequency. Video games manufactured for operation on 60 Hz line power (used in the United States) must not be operated in countries with 50 Hz line power (used in Europe). If a 60 Hz machine operates on 50 Hz line power, the fluorescent line ballast transformer will overheat and cause a potential fire hazard. Check the product identification label on your machine for the line frequency required.

ABOUT NOTES, CAUTIONS, AND WARNINGS

In Atari publications, notes, cautions and warnings have the following meaning:

WARNING — Players and/or technicians can be killed or injured if instructions are not followed.

CAUTION — Equipment and/or parts can be damaged or destroyed if instructions are not followed. You will void the warranty on Atari printed-circuit boards, parts thereon, and video displays if equipment or parts are damaged or destroyed due to failure of following instructions.

NOTE — A highlighted piece of information.

N O T E S

Chapter 1

Installation

How to Use This Manual

This manual provides information for installing, testing, and troubleshooting the Escape From the Planet of the Robot Monsters™ kit.

The manual is divided into the following chapters:

- Chapter 1 describes the installation procedure and the Escape game play.
- Chapter 2 contains self-test procedures.
- Chapter 3 contains troubleshooting procedures.
- Chapter 4 contains illustrated parts lists.
- Chapter 5 contains the schematics for the Escape game PCB, audio PCB, and joystick PCB.

Also bound into this manual is the template for drilling the holes for the Escape control panel.

WARNING

To avoid electrical shock, unplug the video game cabinet during the conversion. After inspection, plug it only into a grounded 3-wire outlet.

Equipment Requirements

See Table 1-1 for the equipment required in the cabinet in which you are installing the Escape kit.

CAUTION

Do not unplug or plug in the Escape game printed-circuit board (PCB) edge connector while the power is on. You could seriously damage the PCB.

Table 1-1 Equipment Requirements for the Escape Kit

Equipment	Specification
Video Display	<ul style="list-style-type: none">■ Color RGB monitor■ Separate positive horizontal and vertical sync or negative composite sync■ Horizontal mounting■ Horizontal frequency 15.750 KHz■ Vertical frequency 60 Hz■ Recommended size: 19 inch■ Video input 1V to 3V peak-to-peak positive polarity
Control Panel	Metal only
Space Below Control Panel	At least 4 1/2 inches deep
Speaker	8 Ohms 10 Watts
Coin Mechanism	+5 VDC or +12 VDC
Power Cord	Three-conductor with ground
Power Supply	+5 VDC \pm 0.25V @ 5.0 amps +12 VDC \pm 0.5V @ 1.0 amp -5 VDC \pm 0.5V @ 1.0 amps

Tools Required

- Two C-clamps
- Drill with 1/4 inch drill bit, a 1 3/16-inch hole cutter (or 1 3/16-inch chassis punch), and a 1 3/4-inch hole cutter
- Phillips screwdriver
- Flat-blade screwdriver
- Socket set
- Wire cutters and strippers
- Straight edge
- Squeegee
- X-ACTO™ knife
- Fast-ons (if you are installing a new JAMMA harness)

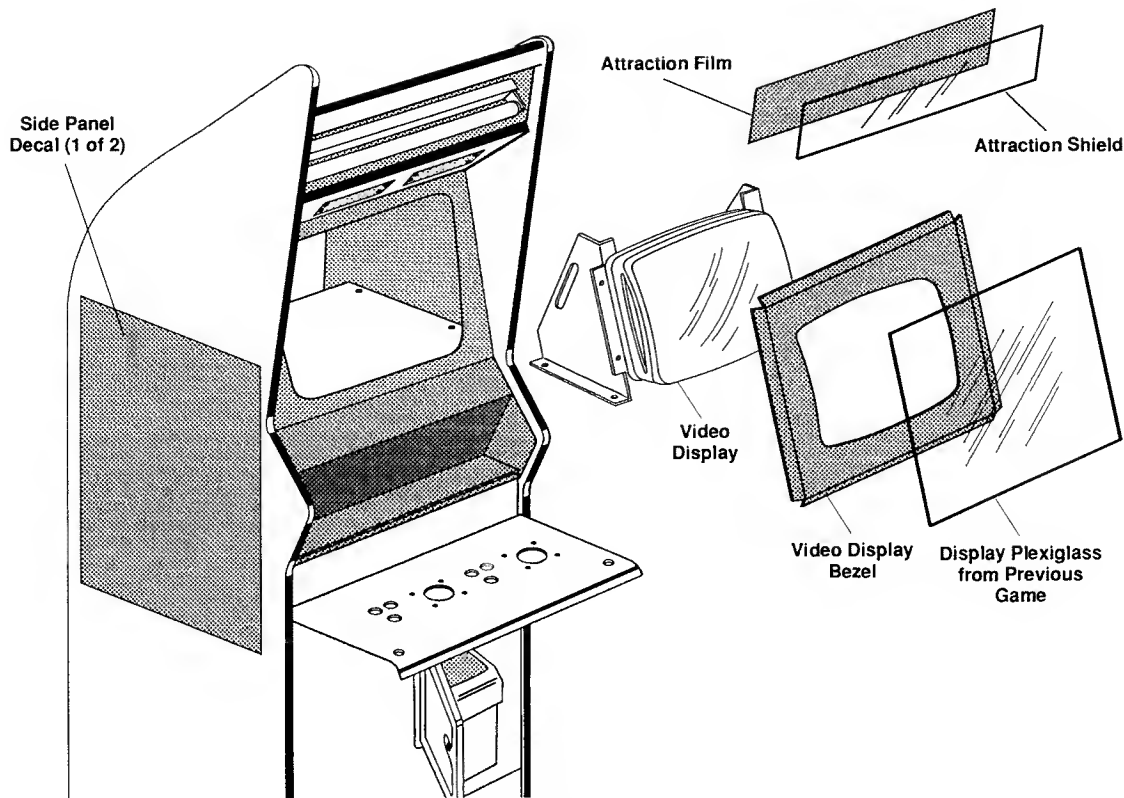


Figure 1-1 Assembling the Escape Kit Parts

Preparing the Existing Game for Conversion

1. Turn off power to the game.
2. Remove the old game PCB(s). Remove the game harness if it is not Japan Amusement Machinery Manufacturers Association (JAMMA)-compatible.
3. Remove all the control panel decals, labels, and controls.
4. Remove any side decals from the cabinet. If your cabinet has wood grain or laminate sides, remove the old graphics and adhesive. If the sides are damaged, repair them before putting on the new decals.
5. Remove the video display plexiglass, display bezel, attraction shield, and marquee, if any.
6. Paint the cabinet, if required.
7. Wipe down and vacuum the cabinet as necessary.

Inspecting the Kit

Check to see that you have all the parts listed in the kit parts list in Table 4-1. If any part is missing or damaged, please contact your distributor and with the Es-

cape kit serial number, part number and description of any missing or damaged parts, and date received.

Installing the Kit Parts

Display Bezel

Find the cardboard display bezel (part no. 047502-01). Measure the size of the existing display bezel and cut the new display bezel to size, if necessary. (See Figure 1-1.)

Product ID and FCC Label

Place the product ID label (part no. 038158-01) and FCC label (part no. 039450-01) on the back of the cabinet.

Side Decals

Find the side panel decals (part no. 047212-01). Wet the left and right side panels of the cabinet with slightly soapy water. Then position the decals as desired. Remove any wrinkles in the artwork using a squeegee. Allow sides to dry.

Attraction Shield

Find the attraction shield (part no. 047205-01) and the attraction film (part no. 047204-01). Using the existing

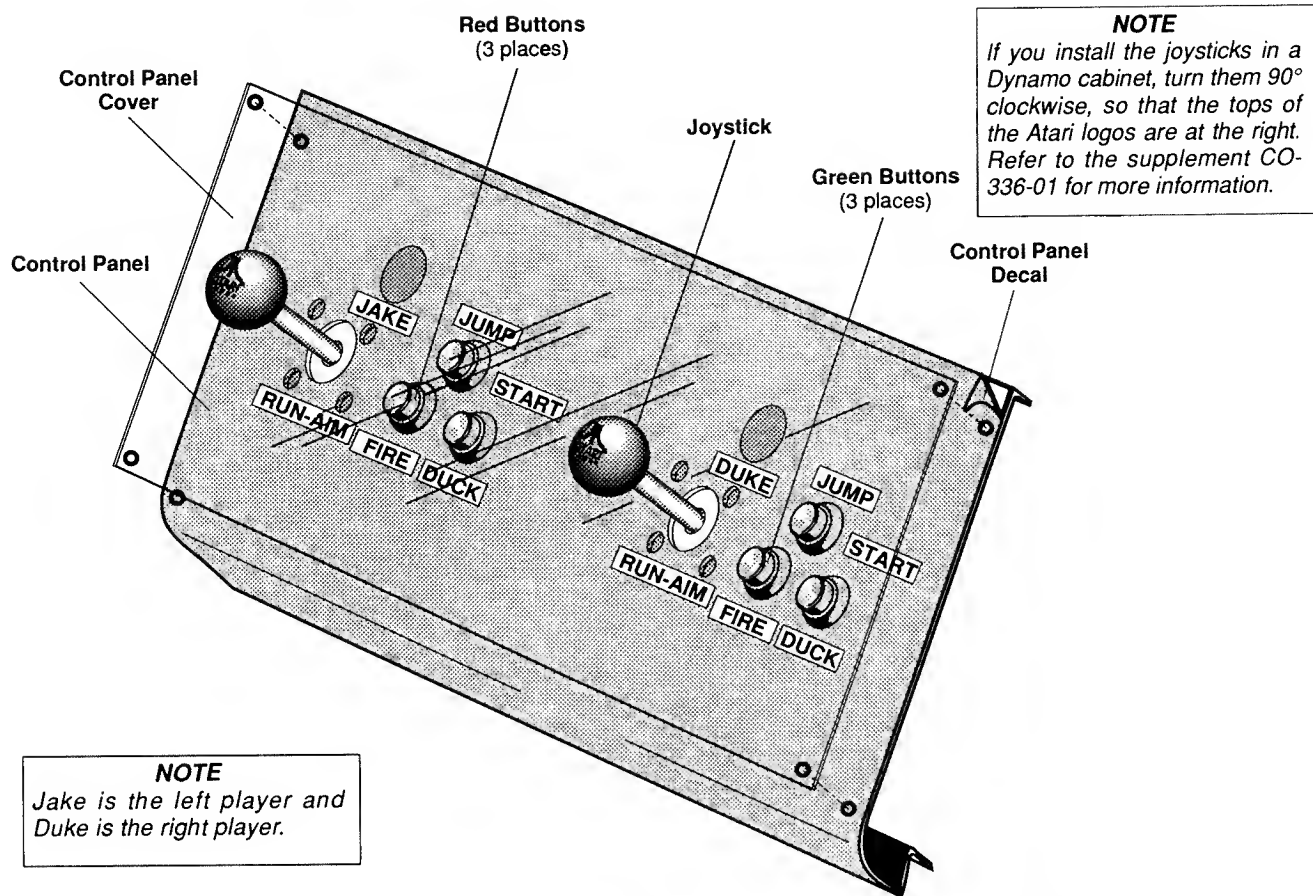


Figure 1-2 Assembling the Escape Kit Control Panel and Cover

shield as a template, cut the shield and film to size, if necessary. Install them on the cabinet as shown in Figure 1-1.

Control Panel

Unpack the Escape control panel cover (part no. 047209-01) and control panel decal (part no. 047206-01). Measure your control panel to find out what size the decal and cover should be. Cut the control panel decal and cover to fit.

Drilling Holes in the Control Panel Cover

1. Clamp the control panel cover to the control panel.
2. Drill four corner holes through the control panel and the control panel cover. Use a 1/4-inch drill bit.
3. Install four carriage bolts and locknuts through the holes to hold the cover and the control panel together.
4. Cut the control panel template out of the manual (see page 1-8). Cut the template down the middle to separate the two parts, one for each set of player controls.
5. Tape the templates next to each other on the con-

trol panel cover. See Figure 1-2 for the controls arrangement.

6. Cut the holes in the cover and panel as shown by the templates using a 1 3/16-inch hole cutter for the button holes and a 1 3/4-inch hole cutter for the joystick knob holes. Use a 1/4-inch drill bit to drill the mounting holes for the joysticks.

Installing the Control Panel Decal and Labels

1. Disassemble the control panel and the control panel cover. Deburr the holes in the cover and the panel.
2. Install the control panel decal on the control panel. Using a sharp knife, cut out the holes for the controls in the decal.
3. Put the control labels on the control panel. (See Figure 1-2.)
4. Install the cover on the control panel with four carriage bolts and locknuts.

Installing the Controls

1. Install the red player control buttons on the left player and the green player control buttons on the right. (See Figure 1-2.)

Table 1-2 JAMMA Pin and Wire Connections

Solder Side			Component Side				
Signal	Note (See Below)	Wire Color	Pin		Wire Color	Note (See Below)	Signal
+V RTN	1	BN	A	1	BN	1	+V RTN
+V RTN	1	BN	B	2	BN	1	+V RTN
+5V	2	R	C	3	R	2	+5V
+5V	2	R	D	4	R	2	+5V
-5V	3	OR	E	5	OR	3	-5V
+12V	4	Y	F	6	Y	4	+12V
Key			H	7			Key
COIN CTR 2	5	V/W	J	8	BU/W	5	COIN CTR 1
			K	9			COIN LOCK-OUT
SPKR	TP	W	L	10	BN	TP	SPKR +
AUDIO GND			M	11			AUDIO +
GREEN	6	GN	N	12	R	6	RED
SYNC	6	BN	P	13	BU	6	BLUE
SERVICE SW	NC	GY	R	14	BK	6	VIDEO GND
			S	15	W	7	SELF-TEST
Right Player (Duke)					Left Player (Jake)		
COIN 2	8	OR	T	16	Y	8	COIN 1
START 2	NC	Y/BK	U	17	W/BK	NC	START 1
DUCK 2	9	Y/BN	V	18	W/BN	9	DUCK 1
DOWN 2	NC	Y/R	W	19	W/R	NC	DOWN 1
JUMP 2	9	Y/OR	X	20	W/OR	9	JUMP 1
RIGHT 2	NC	Y/W	Y	21	W/Y	NC	RIGHT 1
FIRE 2	9	Y/GN	Z	22	W/GN	9	FIRE 1
SWITCH B2	NC	Y/BU	a	23	W/BU	NC	SWITCH B1
SWITCH C2	NC	Y/V	b	24	W/V	NC	SWITCH C1
LT/RT 2	10	Y/GY	c	25	W/GY	10	LT/RT 1
UP/DN 2	11	GY/W	d	26	V	11	UP/DN 1
GND	12	BK/W	e	27	BK/W	12	GND
GND	12	BK/W	f	28	BK/W	12	GND

Notes

NC means no connection required for Escape. TP means twisted pair.

1. Connect four of the large BN wires to the 5V RTN (GND) terminal on the power supply unless the power supply has a 12V RTN. If there is a 12V RTN, connect one of the wires to the 12V RTN (GND) terminal.
2. Three of the R wires go to the +5V terminal on the power supply. If the power supply has a +SENSE terminal, connect one of these three wires to the +SENSE instead of the +5V. The fourth wire goes to the red wires on the joysticks.
3. Connect both wires to the -5V terminal of the power supply.
4. Connect both wires to the +12V terminal of the power supply. (If your coin counter(s) require(s) 12V, you can use one of these two wires for the + side of the coin counter(s).)
5. Connect to the negative side of the coin counter(s). If your counter(s) require 5V, you will need to splice into the red wire that brings +5V to the joysticks. See Note 2, above. *Note: Do not use 24V counters.*
6. Attach to the video display.
7. Use this wire if you want an external self-test switch. However, the Escape kit already has two self-test switches on the PCBs. If you connect an external self-test switch, first make sure the switches on the PCB are switched off. Then connect this wire to the N.O. terminal on the external self-test switch. Connect the common terminal of the self-test switch to one of the BK/W wires (GND).
8. Connect to the N.O. terminals of the two coin switches. Connect the common terminals of the coin switches to one of the BK/W wires.
9. Connect to the N.O. terminals of the control switches. Connect the common terminals of the switches to one of the BK/W wires.
10. Connect to the gray wire on the joystick.
11. Connect to the white wire on the joystick.
12. Connect one wire to the negative sense terminal of the power supply (if it exists). Connect the second wire to the common terminals of the coin switches. Connect the third wire to the common terminals of the control switches. Connect the fourth wire to the black wires on the joystick harness.

NOTE

After the buttons are tightened on the control panel, you can put a small amount of clear RTV silicon on two or three areas of the locknut to keep the buttons from being unscrewed from the top.

2. Mount each joystick assembly on the control panel with four carriage bolts and locknuts. Install the joysticks so the Atari Games logos are upright. See Figure 1-2. *If you install the joysticks in a Dynamo cabinet, turn them 90° clockwise, so that the tops of the Atari logos are at the right. Refer to the supplement CO-336-01 included with this kit for more information on special-case control installation.*

NOTE

If you are installing the kit in a Dynamo cabinet, install the joysticks with the Atari logo upside down.

3. Install the joystick harnesses on each joystick.

General Harness Installation

1. If your game does not already have a JAMMA harness, find the JAMMA harness (part no. A046501-01) in the kit and install it.
2. Using Table 1-2, *JAMMA Pin and Wire Connections*, for wiring information, connect the JAMMA harness to existing component harnessing. You can do this using crimp splices or by butt soldering.

WARNING

Do not simply tie the wires together. If you do, you could cause intermittent problems, loose connections, oxidation, or even a fire.

Connecting Power Wires

1. Connect the wires on the JAMMA harness to the wires for the power supply. You need +5V, -5V, and +12V for the Escape kit. This kit may not require all of the voltages used in your original game. Tie off any unused wires on the power supply.
2. You will notice that there is more than one wire for each voltage. You must use more than one wire, as called out in the footnotes of Table 1-2. Using more than one wire for each voltage ensures that you do not overload the edge connector and cause it to burn.

Connecting Video Display Wires

Connect the wires designated for the RED, GREEN, and BLUE video guns along with the sync and ground wires.

NOTE

The JAMMA harness provides only negative composite sync. However if your video display requires separate positive sync, see Chapter 3 for alternative wiring.

Connecting Coin Door Wires

1. Connect the wires on the JAMMA harness to the coin switches and meter.
2. Connect one side of the door lamps to one of the BK/W wires. Connect the other side of the door lamps to the R wire supplying +5V to the joysticks.

NOTE

Do not use -5V for the coin door lamps. -5V is required for audio.

(Some games have separate power supply outputs for the coin door lamps. If you choose to use these outputs, make sure you connect both sides of the lamps to the terminals on the power supply.)

3. Be sure to clean the coin mechanisms; however, *do not lubricate the coin mechanisms.*

Connecting the Control Wires

Connect the joystick wires to the JAMMA harness according to the information in Table 1-2. Check the centering of the joystick after you install the game PCB. The test screen is in the game self-test, explained in Chapter 2.

Grounding the Cabinet

Find the ground lead (green) of the 115V input power line. Connect this lead in daisy-chain fashion to a bare metal part of the coin door, control panel, video display, and power supply. *This is a safety requirement for the players' protection.* This AC ground must be of #18 AWG wire or larger.

Checking the Cabinet Systems

Before plugging in the game PCB, turn on the power to the game, and check +5 Volts on pins 3, 4, C, and D of the JAMMA connector; +12 Volts on pins F and 6; and -5 Volts on pins E and 5. Check that the video display and the attraction lamp have power.

Now turn off the power to the game.

Installing the Escape Printed-Circuit Boards

1. Find the Escape PCB Assembly (part no. A047201-01) and install it inside the cabinet. Use the nylon standoffs in the kit.
2. Make sure the interconnect harnesses are installed correctly and are tight. See Figure 1-3.
3. Connect the JAMMA connector to the PCB.
4. Apply power to the game. Check that the game PCB functions. If a video picture is not present, refer to Chapter 3.

Testing After Power-Up

Use the self-test to check the operation of the game. Refer to Chapter 2 for information about the self-tests.

We suggest that you perform a self-test when you first set up the game, each time you collect the money, or when you suspect game failure.

Checking the Joystick Centering

Check the centering on the joystick test screen in the self-test. The centering screen and procedure is explained in Chapter 2.

Setting the Coin and Game Options

The Escape coin and game options are set during the self-test. See Chapter 2 for information about the option settings.

Game Play

This section of the manual describes the theme of the Escape game and the game play features.

Introduction

Escape from the Planet of the Robot Monsters is a one- or two-player simultaneous game. The game features a science fiction theme, comic book-style graphics and slapstick humor that players will enjoy. Player controls are a Hall-effect joystick for control over speed and direction, and fire, duck and jump buttons (all three buttons pressed at the same time will explode the bombs the player has collected).

Playing the Game

Escape takes place on the surface of a futuristic, imaginary industrial planetoid called Planet X. The humans stationed on Planet X have been enslaved and forced to create a robot empire destined to attack earth. The

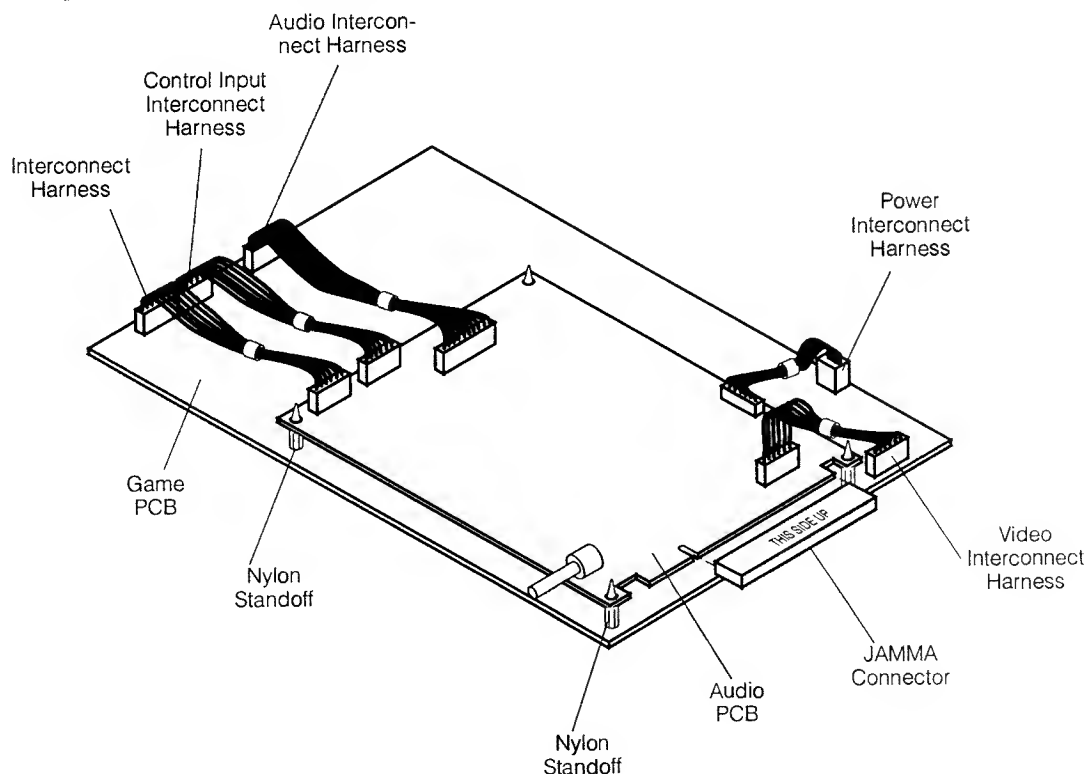


Figure 1-3 Game PCBs and Harnesses

two heroes, Jake and Duke, must find their way through multiple levels of robot factories and the maze of the canal zones in search of Professor Sarah Bellum (a voluptuous young lady famous for her knowledge of cybernetics), freeing other human hostages along the way.

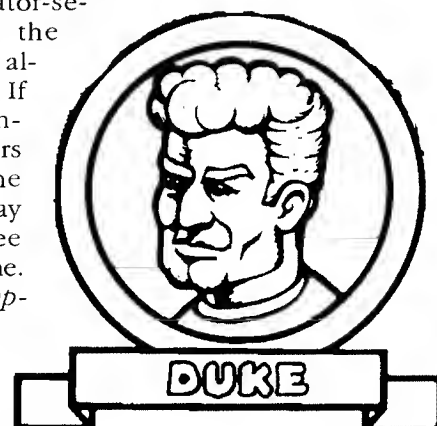
Players portray Jake and Duke, the two heroes of the game. They must fight their way through hordes of evil robots to face the gigantic "reptilons" that have taken over Planet X. There are innumerable different robots and reptilons for the players to conquer, each having its own unique comic book-style appearance, action, and level of computerized intelligence.

In the robot factories, the heroes find food lockers, bomb lockers, and special weapons to help their defense. Bonus points are awarded for firing at and destroying the computers and other furniture. On each level of the factory they must find the switch to start the "electro-stairs" or ladder to climb to the next floor. At the end of each factory level, bonus "lives" are awarded to each player according to the number of human captives rescued.

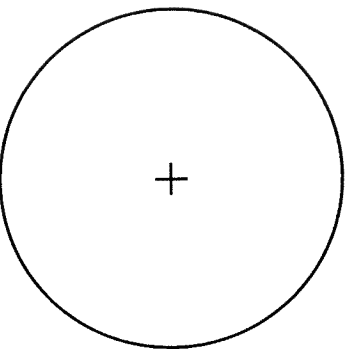
After defeating the reptilon stationed at the exit of one factory and clearing the next level, the player finds himself seated in a comically animated "cybersled" at

the beginning of the canal zone maze. If he finds his way through the maze, the player selects one of three doors to choose his path through the three different sectors of the robot factories of Planet X. If he cannot find his way through to the end of the maze, the game automatically chooses a default path.

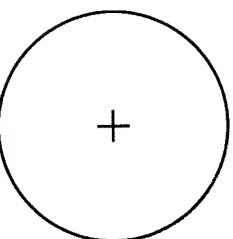
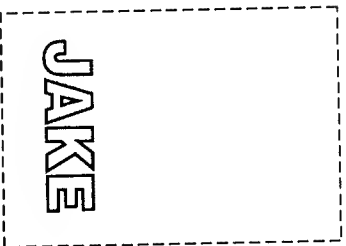
Players are encouraged to add coins to continue on their mission to find Professor Sarah Bellum and liberate human hostages. In order to increase longevity of player interest in *Escape*, there is an operator-selectable limit to the number of coins allowed per game. If this option is enabled, only players who have become skilled at game play are allowed to see the end of the game. See the *Game Options* section in Chapter 2 for more information about this option.



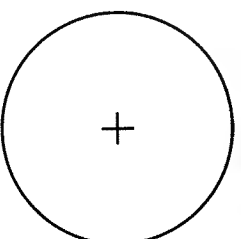
NOTE: Jake is the left player and Duke is the right player.



RUN-AIM

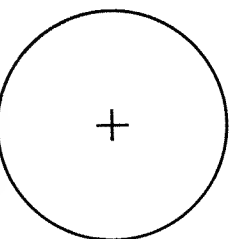


FIRE

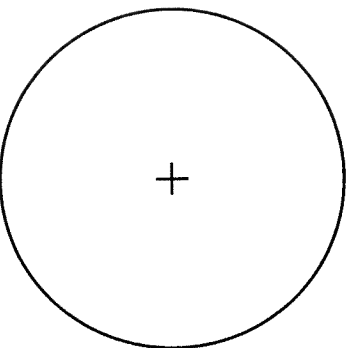


JUMP

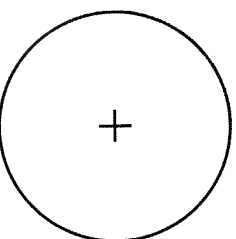
START



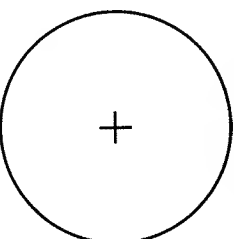
DUCK



RUN-AIM

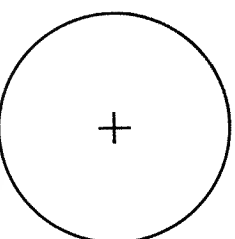


FIRE



JUMP

START



DUCK

Self-Test

Use the Escape from the Planet of the Robot Monsters™ kit self-test to check the condition of the game circuitry and controls. You will see the self-test information on the video display and hear the sound test information through the speakers. You do not need any additional equipment to perform the self-test.

Perform the self-test when you first set up the game, each time you collect the money, or when you suspect game failure.

Enter the self-test by turning on the self-test switch on the stand-alone audio PCB or on the main PCB in the drawer. After the sound test (the last screen), the sequence starts over with the controls test. If you turn off the self-test switch at any time during the self-test, the game returns to the attract mode.

This chapter shows the screens in the self-test and explains each of the tests. The screens and explanations are arranged in the order they appear in the self-test. Table 2-1 lists all the self-test screens and their purposes.

Entering and Exiting the Self-Test

To enter the self-test, turn on one of the two self-test switches. One switch is on the audio PCB, and the other switch is on the edge of the game PCB.

Exit the self-test by switching off the self-test switch. Make sure both switches are switched off.

Table 2-1 Summary of All Self-Test Screens

Screen	Use or Purpose
RAM Screen	Appears only if a RAM is bad.
ROM Screen	Appears only if a ROM is bad.
Controls Test Screen	Use to test the player controls.
Joystick Test Screen	Use to center and calibrate the joysticks.
Coin Options Screen	Use to set and check the coin options settings.
Game Options Screen	Use to set and check the game options settings.
Statistics Screen	Displays game statistics.
Histogram Screen 1	Displays the histogram for all new games.
Histogram Screen 2	Displays the histogram for all continued games.
Histogram Screen 3	Displays the histogram for the level at which players quit.
Histogram Screen 4	Displays the histogram for the number of game "deaths" per level.
Playfield Test Screen	Use to test the game scrolling circuitry.
Motion Object Screen	Use to test the movement and color of game objects.
Alpha Test Screen	Use to check the alphanumeric displays.
Color Test Screen	Use to check the video display color circuits.
Red Color Purity Screen	Use to check the red color purity in the video display.
Green Color Purity Screen	Use to check the green color purity in the video display.
Blue Color Purity Screen	Use to check the blue color purity in the video display.
White Color Purity Screen	Use to check the white color in the video display.
Grey Color Purity Screen	Use to check the grey color in the video display.
White Convergence Screen	Use to check and adjust video display convergence.
Violet Convergence Screen	Use to check and adjust video display convergence of red to blue.
Green Convergence Screen	Use to check and adjust video display convergence of red and blue to green.
White Convergence Screen	Use to check and adjust video display convergence of red, blue, and green.
Sound Test Screen	Use to check the audio PCB circuits, RAM, and ROM. Also use to check the coin mechanism operation.

NOTE

If the game is stuck in self-test even though you have switched off a self-test switch, then the other switch is still switched on to self-test. Both switches must be switched off.

RAM and ROM Test

The self-test checks the game RAM and ROM first.

NOTE

To bypass the RAM, ROM, and controls tests, press the left jump, duck and fire buttons simultaneously **before** you turn on the self-test switch.

Testing Game RAMs

While the test is checking the RAMs you see the message *Testing RAM. Please wait.* If the game has a bad RAM, you may see a message, or if the problem is severe, you may only see a colored screen.

See Table 2-2 for the location of the RAM if you see a message. See Table 2-3 if you have a colored screen, but no message.

If the test finds no RAM errors, no message appears and the program goes to the ROM test after a 20-second delay.

Table 2-2 Bad RAM Locations by Error Address

Error Address	RAM Location		Used By
	High	Low	
3F0000	70D	86D	Video processor only
3F4000	70F	86F	Video processor only
3F8000	70H	n/a	Video processor only
3E0000	112H	112F	Video processor only
160000	40M	50M	Common RAM (Video and second processor)

Table 2-3 Bad RAM Type by Colored Screens

Screen Color	RAM Error Location
Red	Working RAM
Green	Playfield RAM
Blue	Motion Object RAM
Purple	Alphanumeric RAM
Yellow	Common RAM

Testing Game ROMs

The game has two sets of processor ROMs. The video processor ROMs are tested first. The second processor ROMs are tested next. This takes about 40 seconds. When a ROM is tested, a hexadecimal number appears after each ROM loca-

Table 2-4 ROM Locations by Error Address

Error Address	ROM Location		Used By
	High	Low	
000000	10U	10S	Second processor only
000000	50A	40A	Video processor only
020000	50B	40B	Video processor only
040000	50D	40D	Video processor only
090000	50E	40E	Video processor only
060000	40K	50K	Common ROM (video and second processor)

tion. This number is used by Atari Games development.

If the game has an error in the program ROM, then the error number is shown at the bottom of the screen. See Table 2-4 for the location of the bad ROM.

If you think you have a ROM error, but the screens show no messages, see Table 3-3 for information about the locations of various ROM functions.

Depending on the severity of the ROM error, you may or may not be able to go to the next test by pressing the left jump button. If you have more than one ROM error, you will need to press the left jump button several times.

VBLANK Test

The VBLANK circuit is tested after the ROMs. The VBLANK test checks the interrupt circuit to the main processor. If the circuit is not working, you will see at the top of the *Controls Test* screen, below the title, the message *Waiting for Interrupt.*

You can not go any further in the self-test if you have this message, and the game will not operate with a VBLANK error.

Controls Test

The controls test screen is shown in Figure 2-1. The top six names on the screen are used to test the buttons. The rest of the screen is used for testing the joysticks.

NOTE

If you see the words *Waiting for Interrupt* at the top of the screen, you have an error in the VBLANK interrupt circuit.

Testing the Pushbuttons

As you press each button, its name on the screen is surrounded by a red box. If the red box does not appear, check the connections, switch, and button mechanism.

Testing the Joysticks

CAUTION

Do not repair the joystick until you read Table 3-1 in Chapter 3.

Left and Right R, L, D, and U check the left and right joystick movement right, left, down and up. As you move the joysticks, the direction name appears in a red box.

The numbers below the direction names show the inputs from the joystick signal.

The horizontal row of numbers shows the input from the left and right movement of the joystick. The center number indicates the actual position of the joystick. The right number is the maximum right movement of the joystick. The left number is the maximum left movement of the joystick.

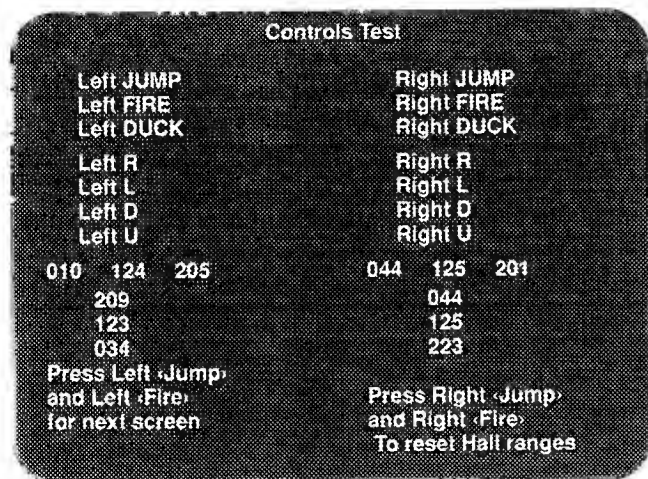


Figure 2-1 Controls Test Screen

As you push the joystick all the way to the left, the center number should change to be about the same as the left number. As you push the joystick all the way to the right, the center number should change to be about the same as the right number.

If the center number does not change, press the right jump and right fire buttons to reset the signal range. If this has no effect, see the troubleshooting table in Chapter 3.

The vertical column of three numbers shows the up and down direction signal from the joystick. The top number is the maximum up (or forward) movement of the joystick. The center number indicates the actual position of the joystick. The bottom number is the maximum down (or back) movement of the joystick.

As you push the joystick all the way forward, the center number should change to be about the same as the top number. As you push the joystick all the way back, the center number should change to be about the same as the bottom number.

If the center number does not change, press the right jump and right fire buttons to reset the signal range. If this has no effect, see the troubleshooting table in Chapter 3.

Press the left jump and fire buttons together to move to the next screen.

Joystick Test

This screen, in Figure 2-2, indicates the center position and calibration of the right and left joysticks.

When this screen appears, the large calibration boxes may be red or green. If a box is red, move the joystick for that box (for example, move the left joystick for the left box) as far as it can move left, right, up, and down. When you move the joystick to the maximum position in one of these directions, a small green rectangle appears at that position in the red box. When you have moved the joystick to all four maximum positions, then the large box changes from red to green.

When the large box is green, and you move the cursor in the large box, the cursor is a +. When you move the cursor inside the small inner square it should be a ■. If the cursor is not a ■ inside the small box, see the section *Calibrating the Joystick* in Chapter 3.

Now check the hexadecimal numbers above each of the boxes. These are the horizontal and vertical values for each joystick. All values should be equal or very close to 80 when the joystick is *not being used*. If any value is not close to 80, go to the section *Calibrating and Centering the Joystick* in Chapter 3.

CAUTION

Do not adjust the joystick until you read the section Calibrating and Centering the Joystick in Chapter 3.

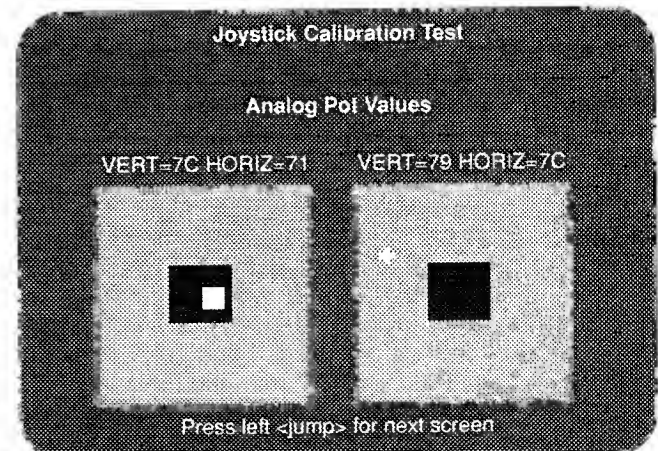


Figure 2-2 Joystick Test Screen

Coin and Game Options

Check and select the coin and game options on this screen.

To move through the options, push the left joystick up or down. You can change the option enclosed in the red box. The factory default settings are shown in green. To change an option setting, move the left joystick right or left.

If you change an option, but then want to change it back to the previous setting, press the left fire button. To save the new settings and exit from the screen, press the left jump button.

To exit the self-test turn off the self-test switch.

Coin Options

The coin options are explained below. The settings, with defaults, are shown in Table 2-5.

Table 2-5 Coin Option Settings

Option	Settings
Coin Mode	1 coin 1 credit ♦ 2 coins 1 credit 3 coins 1 credit 4 coins 1 credit
Right Mech Multiplier	1 coin counts as 1 coin ♦ 4 coins count as 1 coin 5 coins count as 1 coin 6 coins count as 1 coin
Left Mech Multiplier	1 coin counts as 1 coin ♦ 1 coin counts as 2 coins
Bonus Adder	No Bonus Adder ♦ 2 coins give 1 extra coin 4 coins give 1 extra coin 4 coins give 2 extra coins 5 coins give 1 extra coin 3 coins give 1 extra coin Free Play (for demonstration mode)

♦ *Manufacturer's recommended settings*

- **Coin Mode** is the number of coins required for one credit.
- **Right/Left Mech Multiplier** is the number of coins each coin counts as in the coin mechanisms.
- **Bonus Adder** lets you choose bonus coins, no bonus, or free play.

Game Options

NOTE

All the game options do not appear at the same time on this screen. The word More appears at the bottom of the screen to indicate more options at the bottom. Push the left joystick down to see the rest of the options.

The game options are explained below. The settings, with defaults, are shown in Table 2-6.

Table 2-6 Game Option Settings

Option	Settings
Clear High Score Table	Yes No ♦
Restore Factory Options	Yes No ♦
Difficulty Ramping	Yes ♦ No
Lives	3 ♦ 4 5
Maximum Lives Awarded	3 10 ♦
FBI Warning Displayed	Yes ♦ No
Bonus Lives	None Every 100,000 points Every 200,000 points ♦ Every 400,000 points
Difficulty Level	Easy Moderate ♦ Hard
Music in Attract Mode	Yes ♦ No
Special Cost	2 credits to start, 1 credit to continue No special cost ♦
Joystick Position	Normal ♦ Rotated 90° clockwise
Continuations Allowed	Unlimited 8 maximum 10 maximum ♦ 15 maximum

♦ *Manufacturer's recommended settings*

- **Clear High Score Table** lets you clear the high score table.
- **Restore Factory Options** lets you set all the game options to the factory options or lets you use your own settings. Make sure you set this to *no* to use your own chosen settings.
- **Difficulty Ramping** if set to *yes*, increases the game difficulty as the time after the last coin inserted increases.
- **Lives** lets you choose the number of lives each player receives per credit.
- **Max Lives Awarded** lets you choose the maximum number of lives a player can be awarded. The software counts the number of lives awarded to a character from the time play was started.
- **FBI Warning Displayed** lets you choose whether you want to display a "Winners Don't Use Drugs" message and FBI logo during the attract mode.
- **Bonus Lives** lets you choose the number of points required for a player to receive a bonus life.
- **Difficulty Level** lets you set choose the difficulty level of the Escape game.
- **Music in Attract Mode** lets you turn the music on or off in the attract mode.
- **Special Cost** lets you choose two credits to start and one to continue, or no special cost.
- **Joystick Position** lets you choose how the software treats the signals coming from the joysticks. Use *normal* if the

joysticks are installed with the Atari logo facing upright; use *Rotated 90 degrees clockwise* if you installed the joysticks rotated, to fit them into your game's control panel. (See the supplement CO-336-01 included with this kit for more information on special-case control installation.)

- *Continuations Allowed* lets you limit the number of continued games. Limit the number of coins to prevent players from buying their way to the end.

Statistics

Use the information shown on the statistics screen and on the histogram screens to keep track of your game use and maximize your profits. Record the information on the Escape statistics page in the back of this manual.

The information shown on the statistics screen is collected from the last time the statistics were reset.

You can clear the statistics by pressing the right fire button.

- *Plyr 0 Coins* show the number of coins counted in the left coin mechanism.
- *Plyr 1 Coins* show the number of coins counted in the right coin mechanism.
- *Total Sessions* shows the number of unique games played. A unique game is counted from the moment the first player started to the time the last player quit, regardless of how many times the game was continued.
- *0 Plyr Min* is the number of minutes the game was idle.
- *1 Plyr Min* is the number of minutes the game was played by one player.
- *2 Plyr Min* is the number of minutes the game was played by two players.
- *L Plyr Min* is the number of minutes the game was played by the left player.
- *R Plyr Min* is the number of minutes the game was played by the right player.
- *Error Count* shows the number of errors counted in the erasable memory. If you have a count of more than 75 errors, you should have your game serviced by a qualified service technician.
- *Total Coins* is the number of coins put into both coin mechanisms.
- *Avg Time Per Credit* is the average amount of time in seconds that each credit gave.

Histograms

The four histogram screens show the length of game play and the number of games played. Clear the histograms on all four screens at the fourth screen.

Read the histogram screens frequently and record the numbers on the statistics sheet bound in this manual. It is important to read and reset the screens frequently because if more

than 256 games are played in any one time category, then all the numbers on that screen are divided by two.

If you read the screens infrequently, the number of games will always be correct proportionally, but may be incorrect numerically.

You can clear all the histograms by pressing the right fire button when you are on the fourth histogram screen.

The four histogram screens show the following information:

- *New Games* shows the number of seconds each new game lasted.
- *Continuations* shows the number of seconds each continuation of the game lasted.
- *Level Quit At* shows at what level every game ended.
- *Deaths Per Level* shows how many player "deaths" occurred at each level.

Playfield Test

You can test the playfield scrolling circuitry in this screen. Use the left joystick to move left, right, up, and down. Press the left duck button to see all the playfield banks, numbered 0 to 7. Exit the screen by pressing the left jump button.

Motion Object Test

The motion object test screen tests the movement and color of various game objects.

Choose an object with the left jump button. Use the left joystick to move the object. Press the left jump button to move to the next object. Exit the screen by pressing the left jump button.

Alphanumeric Test

The alphanumeric test checks the condition of the alphanumerics in the game. You can see various alphanumeric

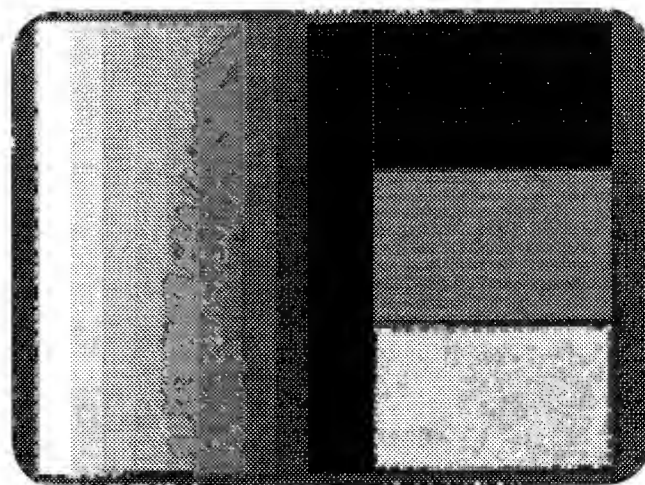


Figure 2-3 Color Test Screen

screens by pressing the right fire button.

If you see an error on the screen, check the EPROM at 125D.

Press the left jump button to go to the next test.

Color Test

This test indicates the dynamic range of the video display color circuit. The screen is shown in Figure 2-3.

The left side of the screen should be white, with a grey scale changing to black in the middle. The right half of the screen should be red, green, and blue from top to bottom, each with a color scale from dark to bright, left to right.

If the screen does not match this description, adjust the video display as described in the video display manual.

Exit the screen by pressing the left jump button.

Color Purity Test

The color purity test has five screens. Each screen is a rectangle of color; the first screen is red. The other screens, which you can see by pressing the left fire button, are green, blue, white, and gray.

These screens show the adjustment of the color purity of the video display. Each screen should display a rectangle of color, with no curving at the corners, no unevenness of color, and no lines in the display.

If the screens are not correct, adjust the video display as described in the video display manual.

Go to the next test by pressing the left jump button.

Convergence Test

The convergence test has three screens: first white, then violet, and finally green. To see the violet and green screens,

press the left fire button. To go to the next test, press the left jump button.

Check the following on the screens:

- The grid lines should be straight within 3.0 mm and the lines should not pincushion or barrel.
- The convergence of the lines on the violet and white screens should be within 2.0 mm.

If these screens do not meet these criteria, adjust the video display as described in the video display manual.

Exit the screen by pressing the left jump button.

Sound Test

The sound test indicates the condition of the music and sound effects circuits on the audio PCB. The sound microprocessor resets at the beginning of the test. You will hear the first sound, which is "chip test," three seconds after the test starts.

After the microprocessor is reset and you hear the first sound, the number of game sounds and the sound CPU status information appear. If the CPU is good, the word *Good* appears. If you get an error message at any point in the sound test, see Table 2-7 for more information.

The test cycles through the following tests:

- Music Chip Test
- Speech Chip Test
- SCOM Reset Test

Use the left joystick to select the sound and the left jump button to listen to them.

Also check the operation of the coin mechanisms on this screen. As you press down the auxiliary coin switch on each coin mechanism, one of the zeroes in *current coin values* changes to one.

Table 2-7 Locations of Bad Sound RAMs and ROMs

Error Message	Location on Audio PCB	Cause or Comment
Music Chip Time Out	4H	
Sound CPU Interrupt Error	2D, 1E, 6K	
Sound CPU RAM 1 Error	2H	
Sound CPU ROM 1 Error	2F	If this message appears when you enter the sound test, the sound processor cannot proceed any further. Press the left jump button to exit the test.
Communications Error #1	1D	Counts the number of errors caused by the audio or game PCB. This means that the SCOM chip (part no. 137526-001) on one of these boards is bad.
		CAUTION <i>The SCOM chip is a CMOS IC and is static-sensitive. If you do not handle it properly you can permanently damage it.</i>
Communications Error #2		Probably the audio PCB is disconnected from the game PCB, or the chip at 1D is not inserted into its socket.
Sound Processor Not Responding		A major problem with the audio PCB. If you cannot enter the self-test, the harness may be disconnected between the audio PCB and the game PCB.

Maintenance and Troubleshooting

This chapter contains regular maintenance information, troubleshooting tables, and repair procedures for your Escape From the Planet of the Robot Monsters game.

The chapter has two parts. The first part contains three troubleshooting tables. One table has general troubleshooting information, the second contains the voltage levels and test points on the PCBs, and the last is a

table of ROM-caused problems with specific ROMs to check and replace.

The last part of the chapter has information about connecting the video display to the Escape kit and maintenance procedures for the joystick.

If a part is mentioned, but not illustrated, see Chapter 4, *Illustrated Parts Lists*, for information.

Table 3-1 Troubleshooting Table

Problem	Suggested Action
Coin Mechanism Problems	<ol style="list-style-type: none"> 1. Check the wiring to the coin mechanism. 2. Check the voltage to the + side of the mechanism. 3. Test the coin mechanisms with the sound test screen in the self-test.
Game Play Problems	<ol style="list-style-type: none"> 1. Check the harness and connectors. 2. Perform the self-test. 3. Check the voltage levels on the PCBs. See Table 3-2, <i>Voltage Inputs and Test Points</i>. 4. Check <i>What ROM Problems Look Like</i>, Table 3-3, for specific ROM problems.
When you first start a character in the middle of a clear space, he does not stand still.	Calibrate and center the joystick.
When a character walks forward, he jerks, and looks as though he was trying to run backwards.	Calibrate and center the joystick.
A character does not move up and down.	Calibrate and center the joystick.
A character does not move back and forth.	Calibrate and center the joystick.
A screen character does not move or moves intermittently.	<ol style="list-style-type: none"> 1. Check the connections. 2. Check if the Hall-effect sensors are bent. 3. Check if the Hall-effect sensors are close enough to the magnets. <i>Be careful not to bend the sensors if you move them.</i>
Joystick Problems	<ol style="list-style-type: none"> 1. Has the joystick been lubricated with white lithium grease? If not, lubricate. 2. Check the harness and connectors. 3. Calibrate and center the joystick. 4. If you took the joystick apart, have you reassembled it correctly? 5. Make sure all the parts on the joystick are in good repair. Repair or replace parts. 6. Check the Hall-effect sensors on the joystick PCB. Make sure they are not bent. 7. Replace the joystick PCB.
The handle does not immediately return to center.	<ol style="list-style-type: none"> 1. Make sure the actuator is installed with the long end through the slides. 2. Lubricate the joystick assembly.
Joystick handle sticks.	<ol style="list-style-type: none"> 1. The screws holding the joystick assembly together may be too tight. 2. Lubricate the joystick assembly.
Sound Problems	<ol style="list-style-type: none"> 1. Is the speaker volume turned up? 2. Check the voltage on the JAMMA connector.

continued on page 3-2

Table 3-1 Troubleshooting Table, Continued

Problem	Suggested Action
Sound Problems, Continued	<ol style="list-style-type: none"> Check the wiring from the audio PCB to the speaker. Check the audio ROM and RAM in the self-test on the Sound Test screen. See Table 2-4, <i>Bad Sound RAM and ROM Locations</i>. Check the voltage level to the audio PCB. See Table 3-2, <i>Voltage Inputs and Test Points</i>. Replace the speaker.
Video Display Problems	
Sync Problems	Does your display need separate positive sync? See the <i>Video Display Sync Problems</i> section in this chapter.
Screen is Dark	<ol style="list-style-type: none"> Is the game plugged in? Is the game turned on? Are the connections good? Is the line fuse good? Is the display brightness turned up? Are the solder connections on the line filter and transformer good? Is the JAMMA connector on the PCB tightly? Check all of the items below. If you answer <i>no</i> to any question, you have a problem with the video display, not with the game circuitry. See your video display service manual. <ol style="list-style-type: none"> Do you have power to the video display? Are the video display's filaments lit? Do you have high voltage to the video display? Is the voltage level to the video display PCB correct? (Power voltage is 100 VAC or 110 VAC, depending on the type of video display. Video signal voltage is 0.5 to 3.5 Volts.) If the level is not correct, check the connectors and the harness. Check the +12 V and the +10 V circuits on the game PCB.
Display area wavers or is too small.	<ol style="list-style-type: none"> Do you have voltage to the video display PCB? Do you have high voltage to the video display?
Picture is wavy.	<ol style="list-style-type: none"> Is the monitor ground connected to the monitor? Are the sync inputs connected properly? Does your monitor need a separate positive sync? See the <i>Video Display Sync Problems</i> section in this chapter.
Picture is upside down.	Switch the horizontal or vertical yoke wires on the display.
Convergence, purity or color problems	Use the screens in the self-test to adjust the video display.
Game is stuck in self-test	Make sure both self-test switches are switched off. If one or both are switched on, then the game will be in self-test.

Table 3-2 Voltage Inputs and Test Points on the PCBs

PCB	Voltage	Test Point or LED	Source and Purpose
Main	+5 \pm 0.25 VDC	VCC1	Logic power from the switching power supply.
Main	+10 \pm 0.5 VDC	+10V or the case of the LM317	Regulated and comes from the +12 V from the audio PCB. Drives the video circuitry.
Main		CR1 LED	Lights when 5 V is applied to the main PCB and the reset (RST) jumper is open.
Audio		CR6 LED	Lights when the +14 V supply is good.
Audio		CR3 LED	Lights when the -14 V supply is good.
Audio		CR13 LED	Lights when the +5 V supply is good.
Audio		CR12 LED	Lights when the +12 V supply is good (but only if the audio PCB has a 12 V regulator at Q3 on it).
Audio	+14V	+V0P (pin 4 of any TL084)	From +14 V. Positive supply for the analog circuitry.
Audio	-5V	-V0P (pin 11 of any TL084)	From the -5 V regulator. Negative supply for the analog circuitry.

Table 3-3 What ROM Problems Look Like

Problem	ROM Causing the Problem	Check the ROM at:
Program works but letters and numbers appear wrong.	Alphanumeric	125D
Program works and the playfield looks OK, but the motion objects are wrong.	Motion object	70U, 43U, 70S, 43S, 64U, 38U, 64S, 38S, 57U, 32U, 57S, 37S
Program works, motion objects look OK, but the playfield is wrong.	Playfield	76U, 47U, 76S, 47S
Garbage on screen; program doesn't work.	Video processor	45J
	Program ROM 0	40A, 50A
Screen is blank even though the power is turned on.	Extra processor	20P
	Program EPROM 0	10U, 10S
Game program is erratic.	Video program ROM 1, 2, 3	40B, 50B, 40D, 50D, 40E, 50E
	Common ROM	40K, 50K
No sound or erratic sound.	Audio ROM	2H on the audio PCB

Video Display Sync Problems

Some video displays cannot use the composite negative sync that is on the JAMMA connector. The Escape kit includes a standard Atari video connector (located at 15K) that provides separate positive sync. Refer to Table 3-4 and make the appropriate connections for your video display.

For other problems, see the video display manual that came with your game.

Joystick Procedures

The Hall-effect joystick provides your game with precise movement and speed control of the player's character. For best performance, lubricate and check the centering of the joystick regularly.

CAUTION

Do not turn or remove the two long screws sticking out over the sides of the PCB when you work on the joystick assembly.

Be careful not to bend or damage the Hall-effect sensors on the PCB.

See Figure 3-3 if you are not sure which screws to turn or what the Hall-effect sensors look like.

Table 3-4 Atari Video Connector Pin Assignments

Pin	Signal
1	Red
2	GND
3	Key (no connection required)
4	Green
5	GND
6	Blue
7	GND
8	GND
9	Negative composite sync
10	Positive V sync
11	Positive H sync

Maintaining the Joystick

1. Turn off the power to the game.
2. Open the control panel and disconnect the harnesses connector. See Figure 3-1.
3. Disconnect the four-pin connector from the PCB on the bottom of the joystick. Take off the PCB.
4. Remove the three hex-head screws holding the PCB to the positioner plate.
5. Remove the four long screws through the lower housing, positioner plate, and upper housing assembly; these screws hold the joystick together.
6. Remove the actuator and the two slides.
7. Check the actuator half-ball, the pivot ball, and the shaft for dirt and wear.
8. Put lithium-base grease (Atari Games part no. 107027-001) on the actuator, the actuator half-ball,

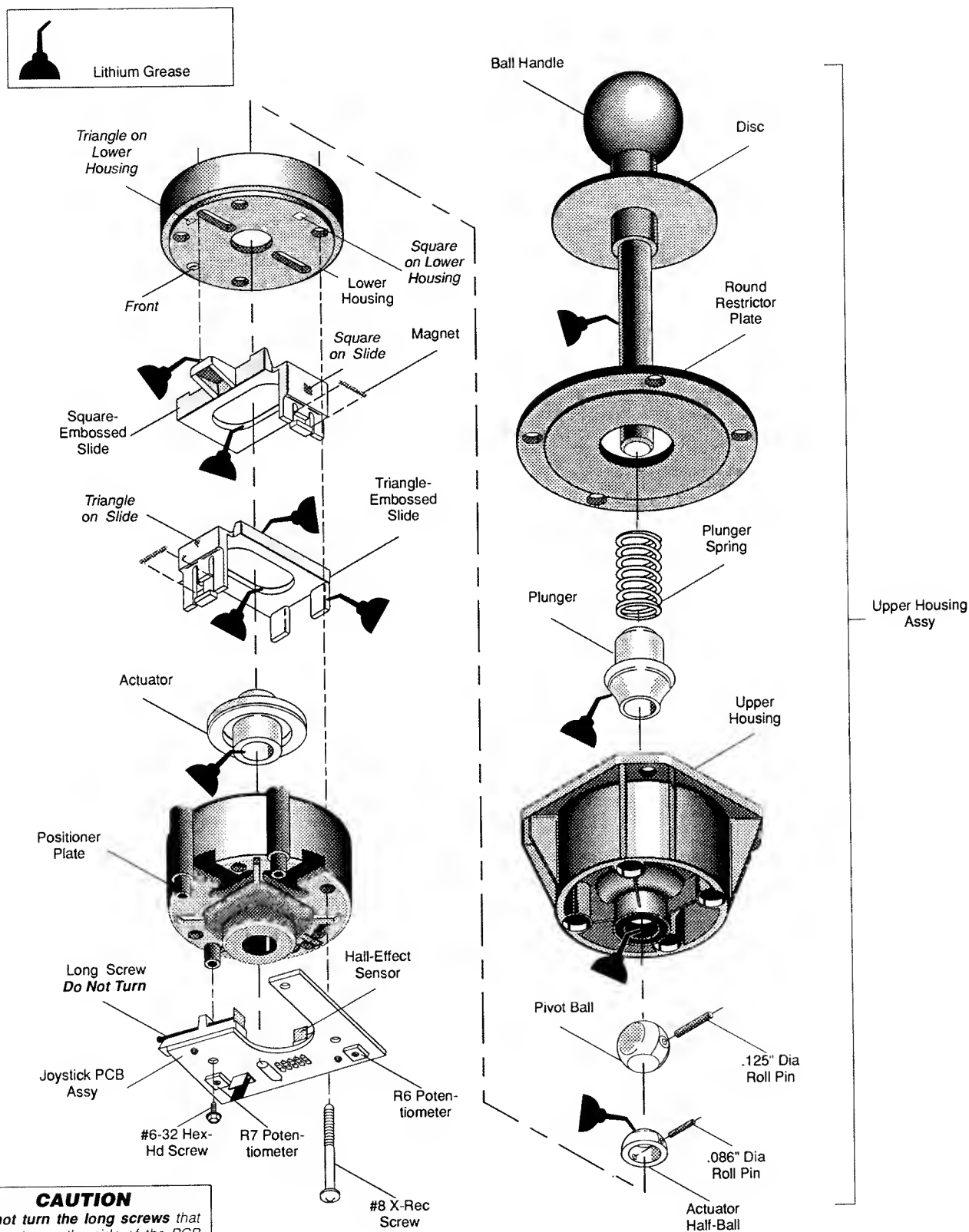


Figure 3-1 Maintaining the Joystick

and the two slides. Also, press down the joystick control knob, expose the pivot ball and plunger, and grease the pivot ball and plunger.

9. Install the lower housing over the shaft so that the ends of the roll pin in the pivot ball fit into the slots on the inside of the housing. Turn the lower housing so that screw casings align with the holes in the upper housing.
10. On both of the slides, apply a small amount of lithium-base grease (Atari Games part no. 107027-001) to the corners and centers. Also put lithium grease on the two small round tabs on the slide with the ■ marked on the side and on the two long tabs on the top of the slide with the ▲ marked on the side.
11. Lay the slide with the ■ marked on the side on top of the lower housing. The ■ on the slide must be above the ■ on the lower housing.
Make sure the two small round tabs on the bottom of the slide fit into the two slots in the lower housing. See Figure 3-2.
12. Lay the slide with the ▲ marked on the side on top of the other slide. The ▲ on the slide must be above the ▲ on the lower housing. The magnet and the two long tabs opposite it should point up.
13. Put lithium grease on the outside of the actuator. Install the long end of the actuator over the shaft and through the two slides.
14. Install the positioner plate over the slides so that:
 - The two long tabs fit through the two parallel slots on the bottom of the positioner plate.
 - The two magnets fit through the other two cutouts in the bottom of the positioner plate.
 - If you installed the positioner plate correctly, then the screw holes in the positioner plate will line up with the screw holes in the lower housing. If they do not, then you probably have installed the slide incorrectly.
15. Insert the four long screws into the screw holes in the positioner plate. Tighten the screws until the head of each screw touches the positioner plate.
16. Tighten the screws so that the assembly is held tightly together and the joystick handle returns freely to the center position. If the handle does not return, loosen the screws until it does.

NOTE

The joystick handle must return freely to the center position. If it does not, players will be frustrated with the game.

17. Before you install the PCB on the bottom of the positioner plate, check the two Hall-effect sensors make sure they are not bent. If one is bent, replace the PCB or the Hall-effect sensor.
If the Hall-effect sensors are OK, then check that the screws that position the sensors are touching, but not pressing on, the sensors.
18. Install the PCB on the positioner plate so that the Hall-effect sensors are in front of the two magnets in the slides. Install the short screws holding the PCB on the positioner plate. *Do not tighten or turn the long screws sticking out over the edge of the PCB.*
19. Install the joystick assembly on the control panel. Put the carriage bolts through the four holes. Use a 3/8-inch hex driver to tighten the four nuts holding the joystick assembly to the control panel. (See Figure 3-1.)
20. Connect the harness. Turn on the game power and check the joystick centering with the self-test.

Checking the Joystick Centering

Turn on the self-test switch. Check the centering on the joystick test screen in the self-test. The screen is shown in Figure 3-2.

When this screen appears, the large calibration boxes may be red or green. If a box is red, move the joystick for that box as far as it can move left, right, up, and down. When you move the joystick to the maximum position in each of these directions, a small green rectangle appears at that position in the red box. When you have moved the joystick to all four maximum positions, then the large box changes from red to green.

When the large box is green, and you move the cursor in the large box, the cursor is a +. When you move the cursor inside the small inner square it should be a ■. If the cursor is not a ■ inside the small box, see the section *Calibrating the Joystick* below.

Now check the hexadecimal numbers above each of the boxes. These are the horizontal and vertical values for each joystick. All values should be equal or very close to 80 when the joystick is *not being used*. If any value is not close to 80, go to the section *Calibrating the Joystick* below.

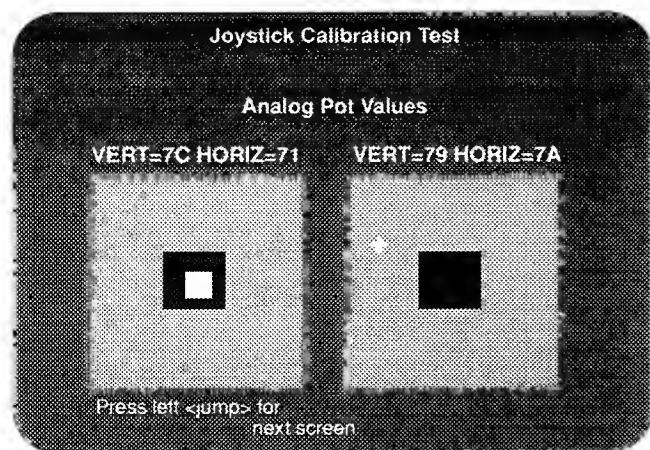


Figure 3-2 Joystick Test Screen

Calibrating the Joystick

The joystick control is calibrated at the factory. However, if you repair the joystick or you think the joystick does not respond correctly, perform the following procedure. Do this procedure only after you have checked the centering and found that the joystick must be adjusted.

1. To adjust a potentiometer, turn the inset slotted screw on the potentiometer on the joystick PCB. See Figure 3-4. *Do not turn the long screws sticking out over the edge of the joystick PCB.*

The R7 potentiometer controls the horizontal value and the R6 potentiometer controls the vertical value. Turn the inset slotted screws on the potentiometers so the horizontal and vertical set-up values are equal or very close to 80. (See Figure 3-3.) Turning the screw clockwise increases the value.

CAUTION

*Adjust only the potentiometers. **Do not move the long screws** on the PCB. If you turn the long screws, you can destroy the Hall-effect sensors. See Figure 3-3 if you are not sure which screws to turn.*

2. Check the centering by moving the **+** to one corner of the white box and releasing the joystick. A small white **■** should return to the center. If it does not, and the **+** sign remains outside the small green box or the **+** is inside the small green box, adjust the potentiometer.

Move the cursor to each of the four corners and adjust the potentiometer until you always see a **■** in the small green box when you release the joystick from the corner position.

3. The numbers above each calibration box should be very close to 80.
4. If adjusting the potentiometer does not change the centering, the problem may be with the potentiometer. However, this is very unlikely.

Disassembling the Joystick

Perform the following procedure to remove and disassemble the joystick control. (See Figure 3-1.)

1. Open the control panel. Take off the connectors to the control panel.
2. Disconnect the four-pin connector from the joystick PCB.
3. Remove the four nuts and washers holding the joystick control to the control panel. Lift the joystick assembly out of the control panel.
4. Remove the three hex-head screws holding the PCB to the bottom positioner plate. Take off the PCB.

CAUTION

***Do not turn the long screws** on the bottom of the PCB that touch the Hall-effect sensors. See Figure 3-3 if you are not sure which screws to turn.*

5. Remove the four long screws through the housings and positioner plate that hold the joystick assembly together.
6. Take apart the lower housing, positioner plate, and upper housing assembly.
7. Remove the actuator and the two slides.
8. If you are replacing a slide or a magnet, press the magnets out of the clips in the slides. Do not drop the magnets.
9. If you are disassembling the upper housing assembly, do the next steps:
 - a. Use a metal punch to push the 0.086-inch-diameter roll pin in the actuator half-ball through the shaft. Slide the actuator half-ball off the end of the shaft.
 - b. Use a metal punch to push the 1/8-inch-diameter roll pin in the pivot ball through the shaft. The pin is not easy to remove because of the pressure on the pivot ball from the spring. Slide the pivot ball off the shaft.
 - c. Pull the shaft out of the housing. Remove the plunger and spring on the shaft.

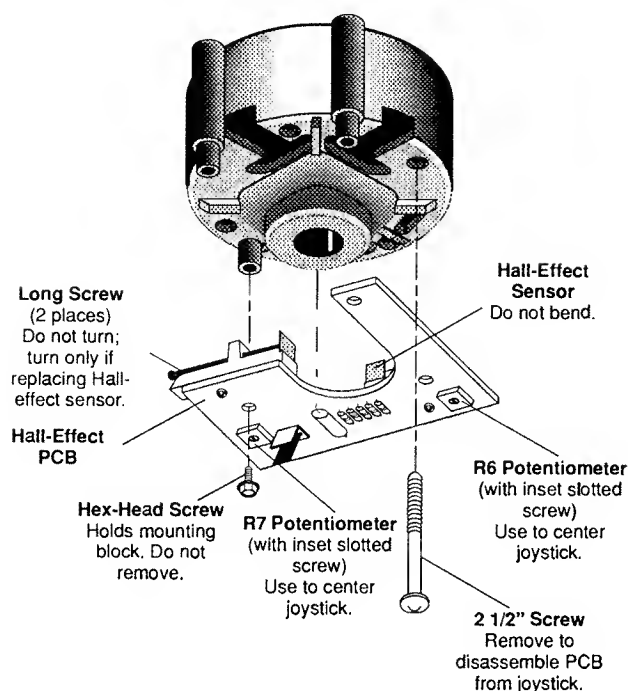


Figure 3-3 Parts of the Hall-Effect PCB

Assembling the Joystick

Perform the following procedure to reassemble the joystick assembly. (See Figure 3-1.)

NOTE

If you disassembled the upper housing assembly, begin with step 1. If you did not disassemble the upper housing assembly, go to step 11.

1. Slide the disc, the restrictor plate, and the spring onto the shaft.
2. Slide the spring on the shaft. Push the large end of plunger onto the shaft and over part of the spring (see Figure 3-1).
3. Slide the plunger onto the shaft and over the spring with the bell-shaped end towards the bottom of the shaft. Grease the pivot ball and plunger.
4. Put the shaft through the top of the upper housing.
5. Before you put the pivot ball on the shaft, insert the large roll pin partway into the pivot ball. The roll pin should not interfere with sliding the pivot ball onto the shaft. Slide the ball onto the shaft, and line up the roll pin with the hole in the shaft.

Now use a metal punch to insert the 1/8-inch-diameter roll pin through the pivot ball and the shaft. Make sure the ends of the roll pin protrude the same amount on both sides.

6. Put the small roll pin partly into the actuator half-ball and slide the half-ball onto the shaft. Slide the actuator half-ball onto the end of the shaft. The flat part should be at the bottom of the shaft.

Line up the holes in the half-ball with the hole in the end of the shaft. Use a metal punch to insert the 0.086-inch-diameter roll pin through the actuator half-ball and the shaft.

7. Install the lower housing over the shaft so that the ends of the roll pin in the pivot ball fit into the slots on the inside of the housing. Turn the lower housing so that screw casings align with the holes in the upper housing.
8. Put lithium-base grease (Atari Games part no. 107027-001) on the actuator and the actuator half-ball.
9. If you disassembled a magnet from a slide, insert the magnet into the slide clip with the marked end of the magnet toward the + marked on the side of the slide.
10. On both of the slides, apply a small amount of lithium-base grease (Atari Games part no. 107027-001) to the corners and centers.

Also put lithium grease on the two small round tabs on the slide with the ■ marked on the side and on the two long tabs on the top of the slide with the ▲ marked on the side.

11. Lay the slide with the ■ marked on the side on top of the lower housing. The ■ on the slide must be above the ■ on the lower housing.

Make sure the two small round tabs on the bottom of the slide fit into the two slots in the lower housing. See Figure 3-1.

12. Lay the slide with the ▲ marked on the side on top of the other slide. The ▲ on the slide must be above the ▲ on the lower housing. The magnet and the two long tabs opposite it should point up.

13. Put lithium grease on the outside of the actuator. Install the long end of the actuator over the shaft and through the two slides.

14. Install the positioner plate over the slides so that:

- The two long tabs fit through the two parallel slots on the bottom of the positioner plate.
- The two magnets fit through the other two cutouts in the bottom of the positioner plate.
- If you installed the positioner plate correctly, then the screw holes in the positioner plate will

line up with the screw holes in the lower housing. If it does not, then you probably have installed the slide incorrectly.

15. Insert the four long screws into the screw holes in the positioner plate. Tighten the screws until the head of each screw touches the positioner plate.
16. Tightened the screws so that the assembly is held tightly together and the joystick handle returns freely to the center position. If the handle does not return, loosen the screws until it does.

NOTE

The joystick handle must return freely to the center position. If it does not, players will be frustrated with the game.

17. Before you install the PCB on the bottom of the positioner plate, check the two Hall-effect sensors to make sure they are not bent. (See Figure 3-3.) If they are bent, replace the PCB or the Hall-effect sensor.

If the Hall-effect sensors are OK, then check that the long screws on the PCB touch the sensors but do not press on them.

18. Install the PCB on the positioner plate so that the Hall-effect sensors are in front of the two magnets in the slides. Tighten the small screws holding the

PCB on the positioner plate.

The long screws on the PCB should touch the Hall-effect sensors and the sensors should touch the magnets on the slides when the joystick handle is at rest. Turn the long screws carefully if you need to adjust the position of the sensors.

CAUTION

*If a Hall-effect sensor should be moved closer to a magnet, **carefully** turn the long screw on the PCB. If you turn the long screw too far, you can bend and destroy the Hall-effect sensor.*

19. Install the joystick assembly on the control panel. Put the carriage bolts through the four holes. Use a 3/8-inch hex driver to tighten the four nuts holding the joystick assembly to the control panel.
20. Connect the harness. Turn on the game power. Turn on the self-test switch. Check the centering in the joystick test in the self-test.

The hexadecimal numbers in the top left corner of the screen are the horizontal and vertical set-up values for the joystick. Both numbers should be equal or be very close to 80 when the joystick is not being used. If these are not the values you see, go to section *Calibrating the Joystick*.

Illustrated Parts Lists

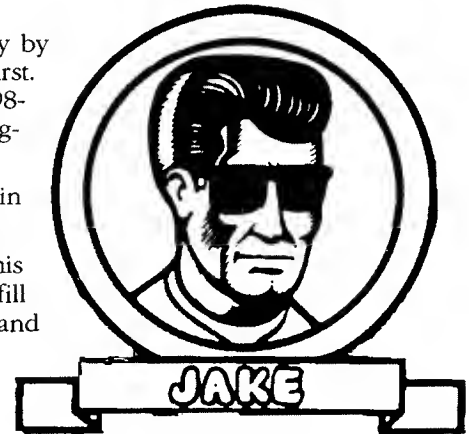
This chapter provides information you need to order parts for your kit.

The parts lists (except for the PCB parts list) are arranged alphanumerically by Atari part number. All "A-" prefix numbers, which are assemblies, come first. Next are part numbers with six numbers followed by a hyphen (000598-through 201000-). Ending the list are part numbers with a two-number designation followed by a hyphen (00- through 99-).

The PCB parts list is arranged in alphabetical order by component. Within each section the parts are arranged numerically by part number.

When you order parts, give the part number, part name, the number of this manual, and the serial number of your kit. With this information, we can fill your order rapidly and correctly. We hope this will create less downtime and more profit from your kit.

Atari Games Customer Service telephone numbers are listed on the inside front cover of this manual.



**Figure 4-1 Escape From the Planet of the Robot Monsters Kit Assembly
A047200-01 B**

Parts List

Part No.	Description	Part No.	Description
A040935-02	Hall-Effect Joystick	047205-01	Attraction Shield
A046501-01	JAMMA Harness Assembly	047206-01	Control Panel Decal
A047138-01	Joystick Harness Assembly	047207-01	Player Control Labels
		047209-01	Control Panel Cover
A047201-01	Escape Game PCB and Audio PCB Assembly. Parts:	047212-01	Side Panel Decal
A047139-01	Power Interconnect Harness Assembly	160044-001	Snap-Action Micro Switch
A047140-01	Video Interconnect Harness Assembly	177010-240	#10-24 Poly Lock Nut
A047141-01	PCB Interconnect Harness Assembly (3)	178237-001	Red Button Assembly
A046147-01	Escape Game PCB Assembly		
A047069-01	JSA Audio PCB Assembly	178237-006	Green Button Assembly
177000-538	#8-32 Nylon Hex Nut (2)	178265-001	L-Style Nylon Standoff
178275-016	Nylon 1-Inch-Long PCB Standoff Support (2)	72-6612S	#6 x 3/4-Inch-Long Cross-Recessed Screw
178278-016	Studded Nylon #8-32 x 1-Inch-Long PCB Standoff Support(2)	75-5116B	#10-24 x 1-Inch-Long Black Carriage Bolt
038158-01	Product I.D. Label	TM-336	Escape Kit Installation Instructions
039450-01	FCC Label	CO-336-01	Escape Kit Supplement: Recommended Instal- lation Methods for Various Games
047202-01	19-Inch Video Display Bezel with Graphics		
047204-01	Attraction Film with Graphics		

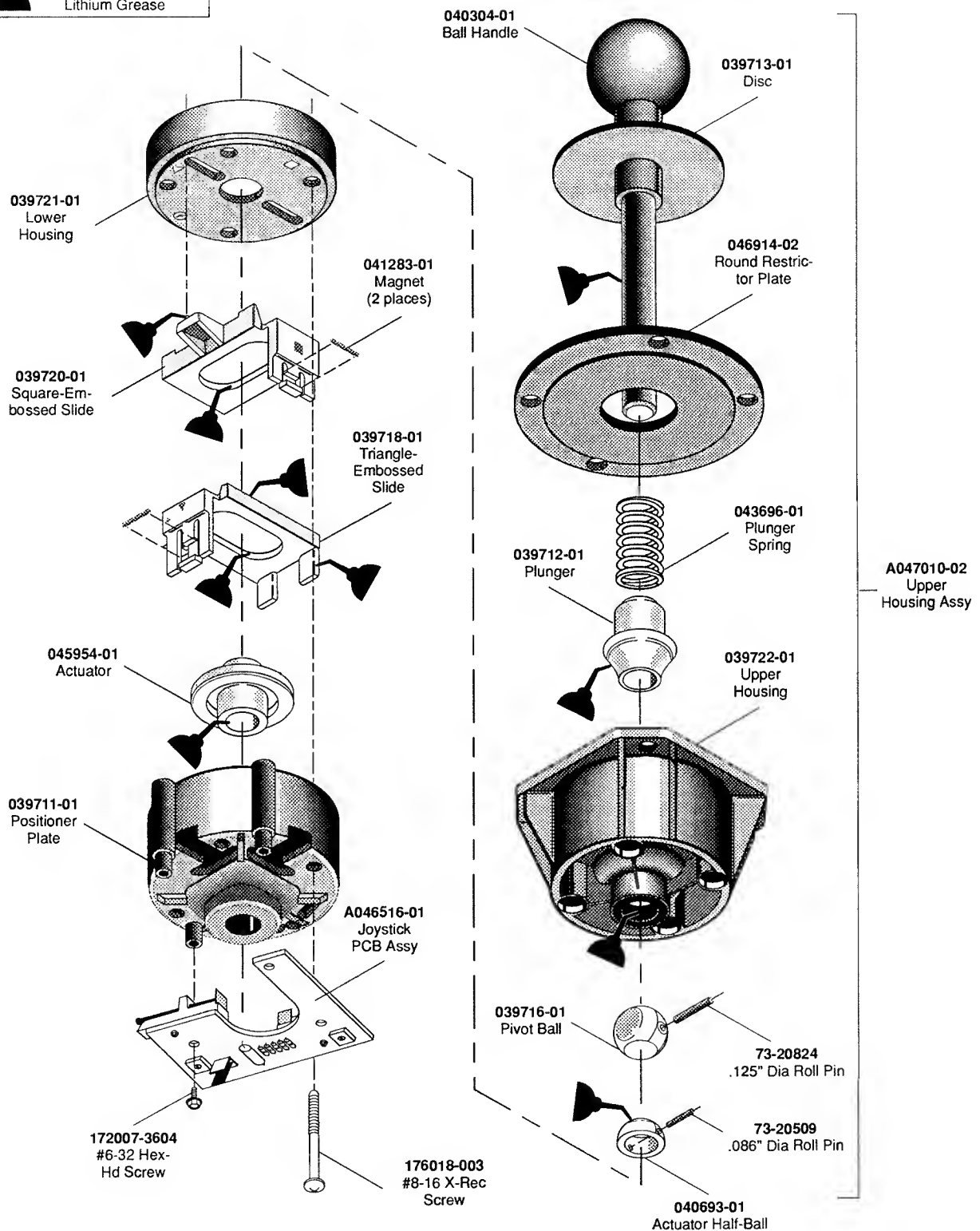
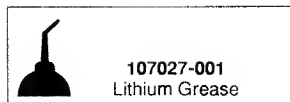
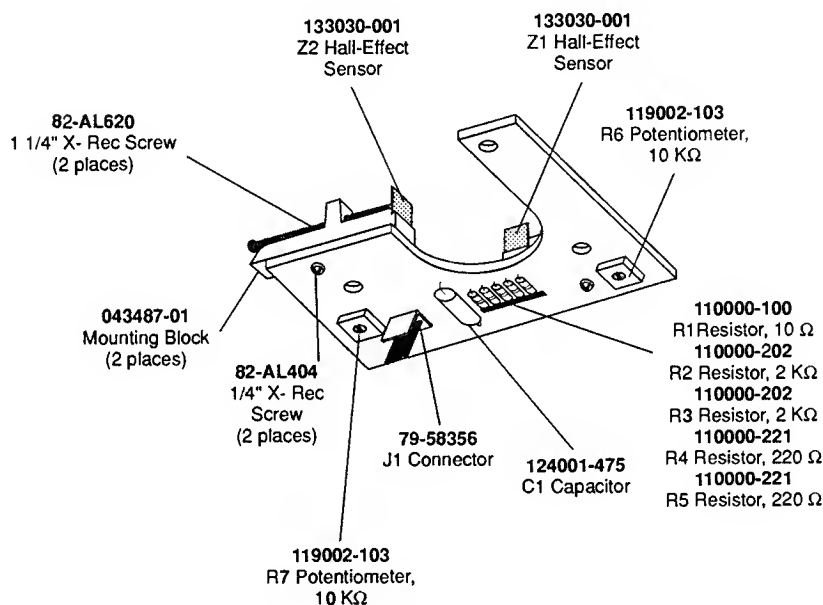


Figure 4-1 Hall-Effect Joystick Assembly
A040935-02 G

Hall-Effect Joystick Assembly Parts List

Part No.	Description	Part No.	Description
A046516-01	Joystick PCB Assembly (See Figure 4-2)	041283-01	.125-Inch-Diameter x .625-Inch-Long Magnet
A047010-02	Upper Housing Assembly	043696-01	Plunger Spring
039711-01	Positioner Plate	045954-01	Actuator
039712-01	Plunger	046914-02	Round Restrictor Plate
039713-01	Disc	107027-001	Lithium Grease Lubricant
039716-01	Pivot Ball	172007-3604	#6-32 x .25-Inch-Long Hex-Head Washer Screw
039718-01	Triangle-Embossed Slide	176018-003	#8-16 x 2.50-Inch-Long Cross-Recessed Thread-Forming Screw
039720-01	Square-Embossed Slide	73-20509	.086-Inch-Diameter Roll Pin
039721-01	Lower Housing	73-20824	.125-Inch-Diameter Roll Pin
039722-01	Upper Housing		
040304-01	Ball Handle		
040693-01	Actuator Half-Ball		

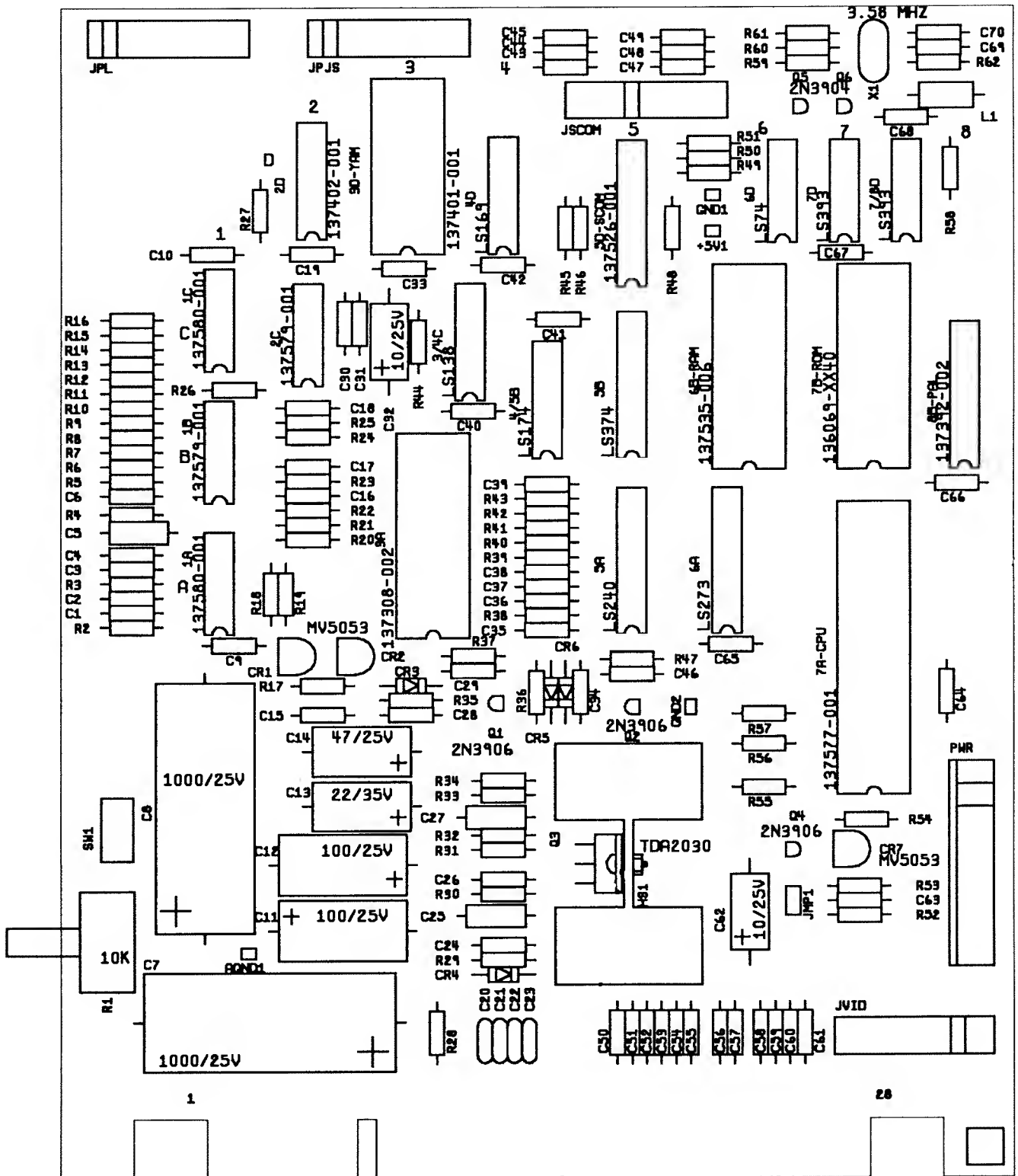


**Figure 4-2 Hall-Effect Joystick PCB Assembly
A046516-01 A**

Parts List

Designator	Description	Part No.	Designator	Description	Part No.
C1	Capacitor, 4.7 μ F, 50 V, Electrolytic	124001-475	R6, R7	Potentiometer, 10 K Ω , Horiz.	119002-103
J1	Connector, 4 Ckt. Header, .156 Ctr	79-58356	Z1, Z2	Hall-Effect Sensor	133030-001
R1	Resistor, 10 Ω , \pm 5%, 1/4 W	110000-100		Mounting Block	043487-01
R2, R3	Resistor, 2 K Ω , \pm 5%, 1/4 W	110000-202		Screw, 1 1/4\" X-Rec, Thread-Cutting	82-AL620
R4, R5	Resistor, 220 Ω , \pm 5%, 1/4 W	110000-221		Screw, 1/4\" X-Rec, Thread-Cutting	82-AL404





**Figure 4-4 JSA Audio PCB Assembly
A047069-01 A**

N O T E S

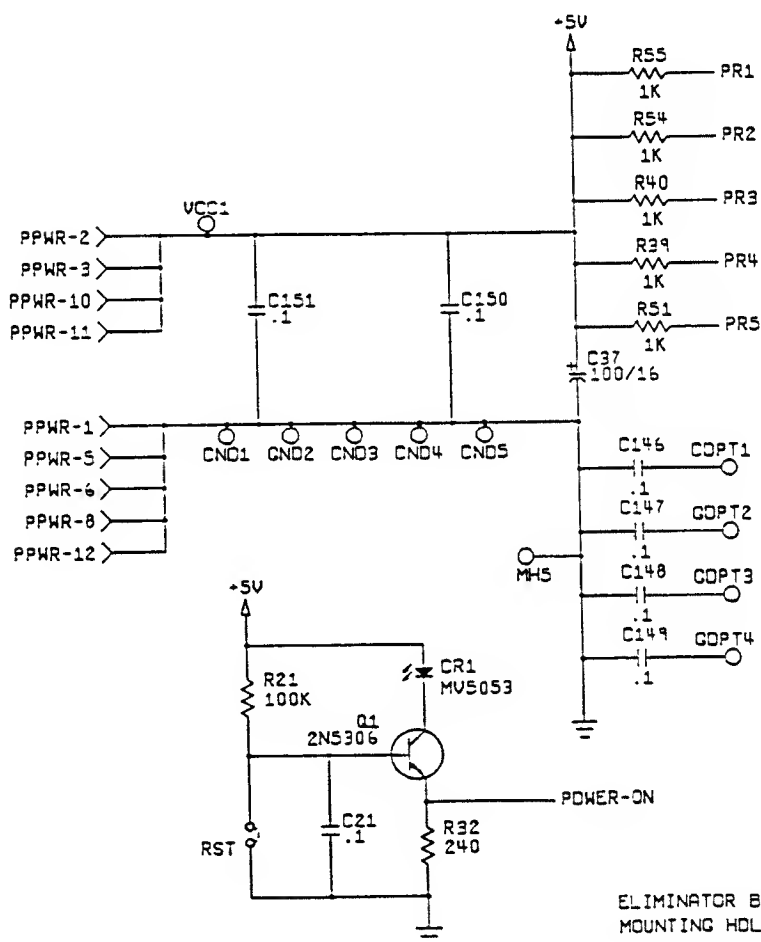
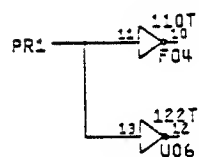
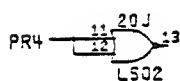
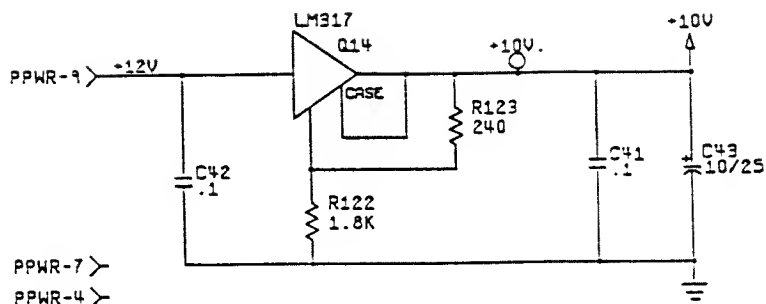
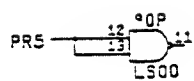


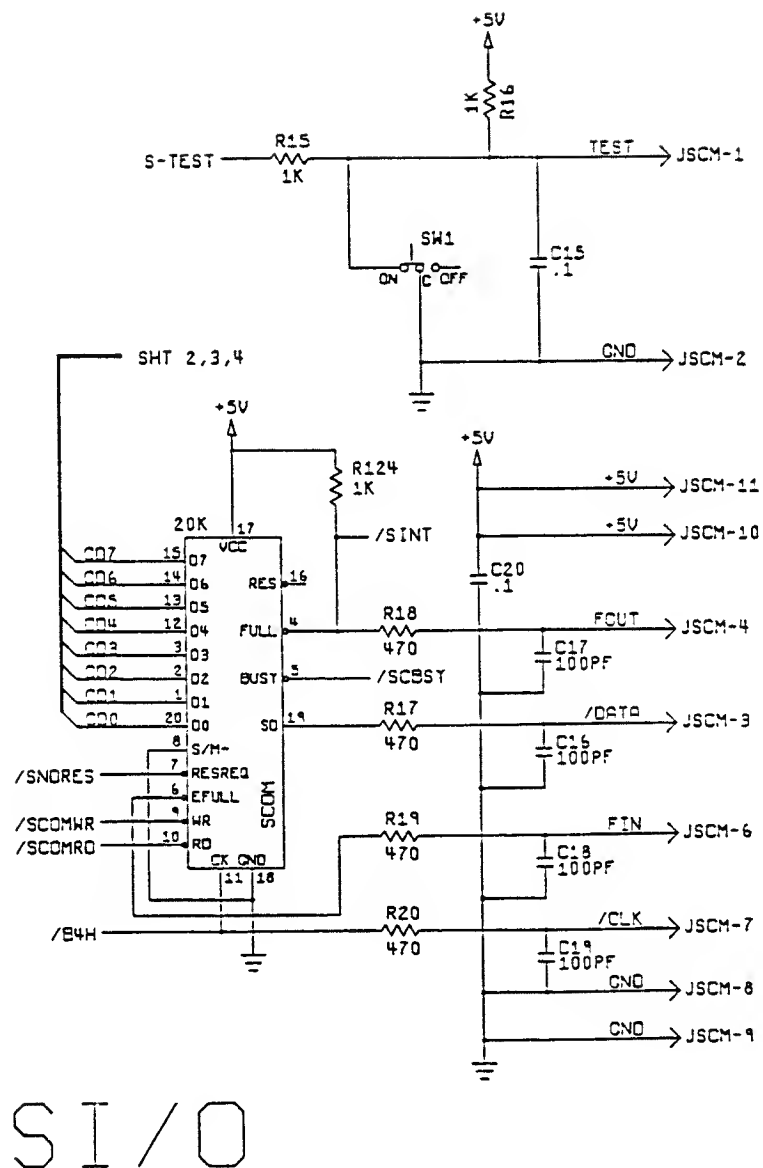
Chapter 5

Schematic Diagrams

About this Chapter...

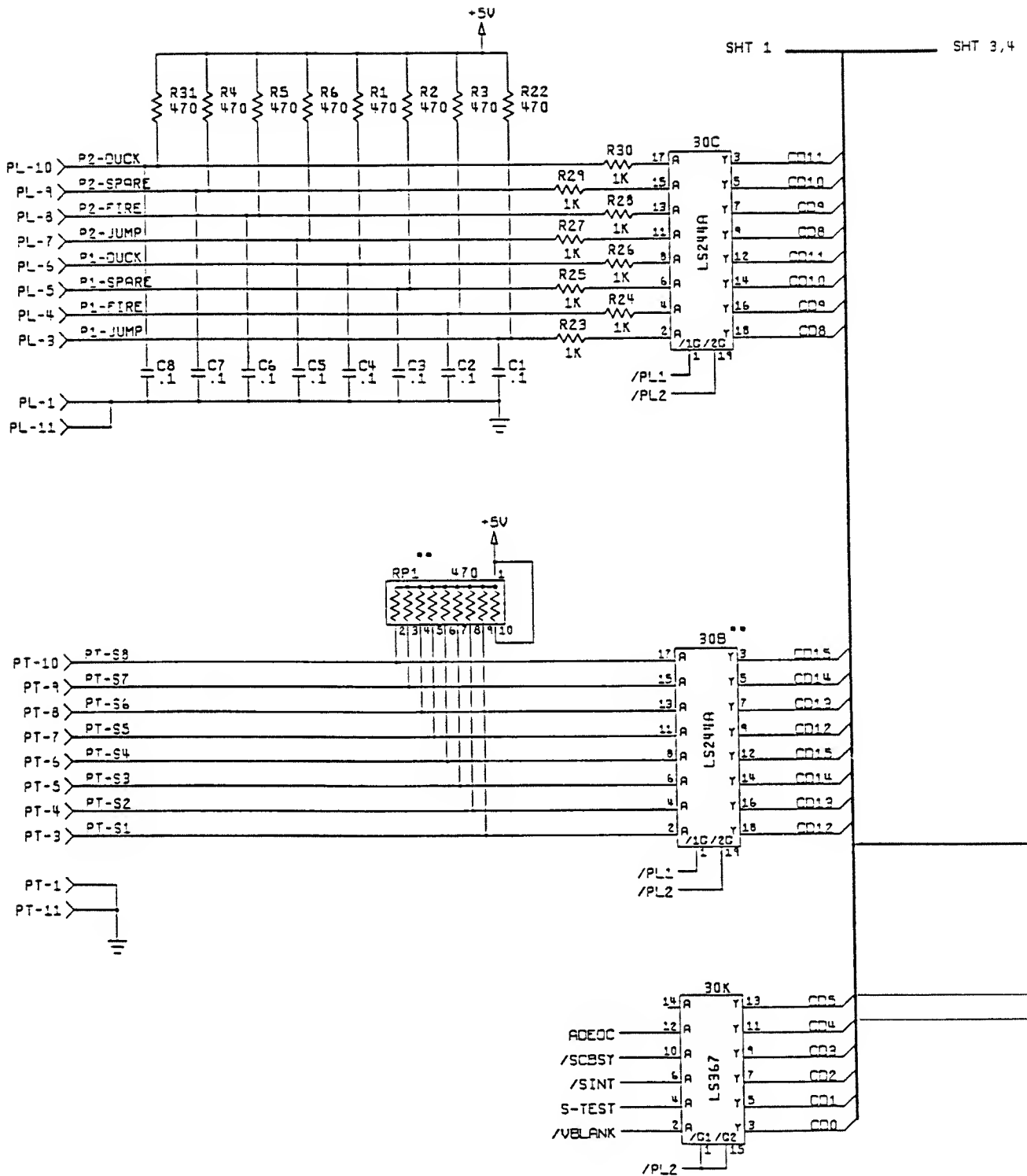
This chapter contains the schematics and wiring diagrams for your Escape From the Planet of the Robot Monsters™ game. These are arranged in the following order: Escape Game PCB, JSA Audio PCB, Memory Map, and Hall-Effect Joystick PCB. (The PCB *assembly* drawings are illustrated in Chapter 4.)

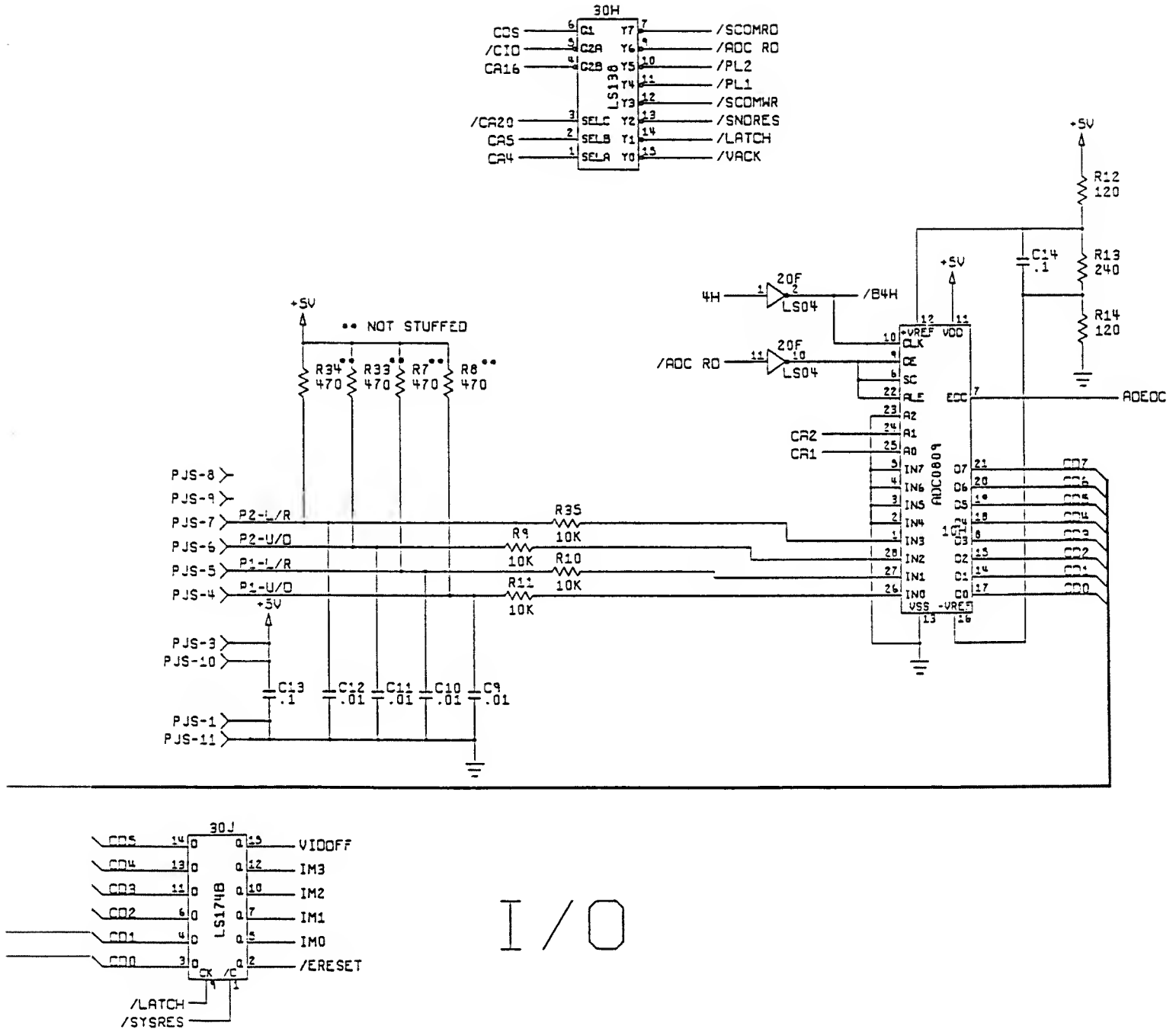




**Figure 5-1 Main PCB Assembly Schematic Diagram,
Sheet 1 of 9**

A046145-01 E

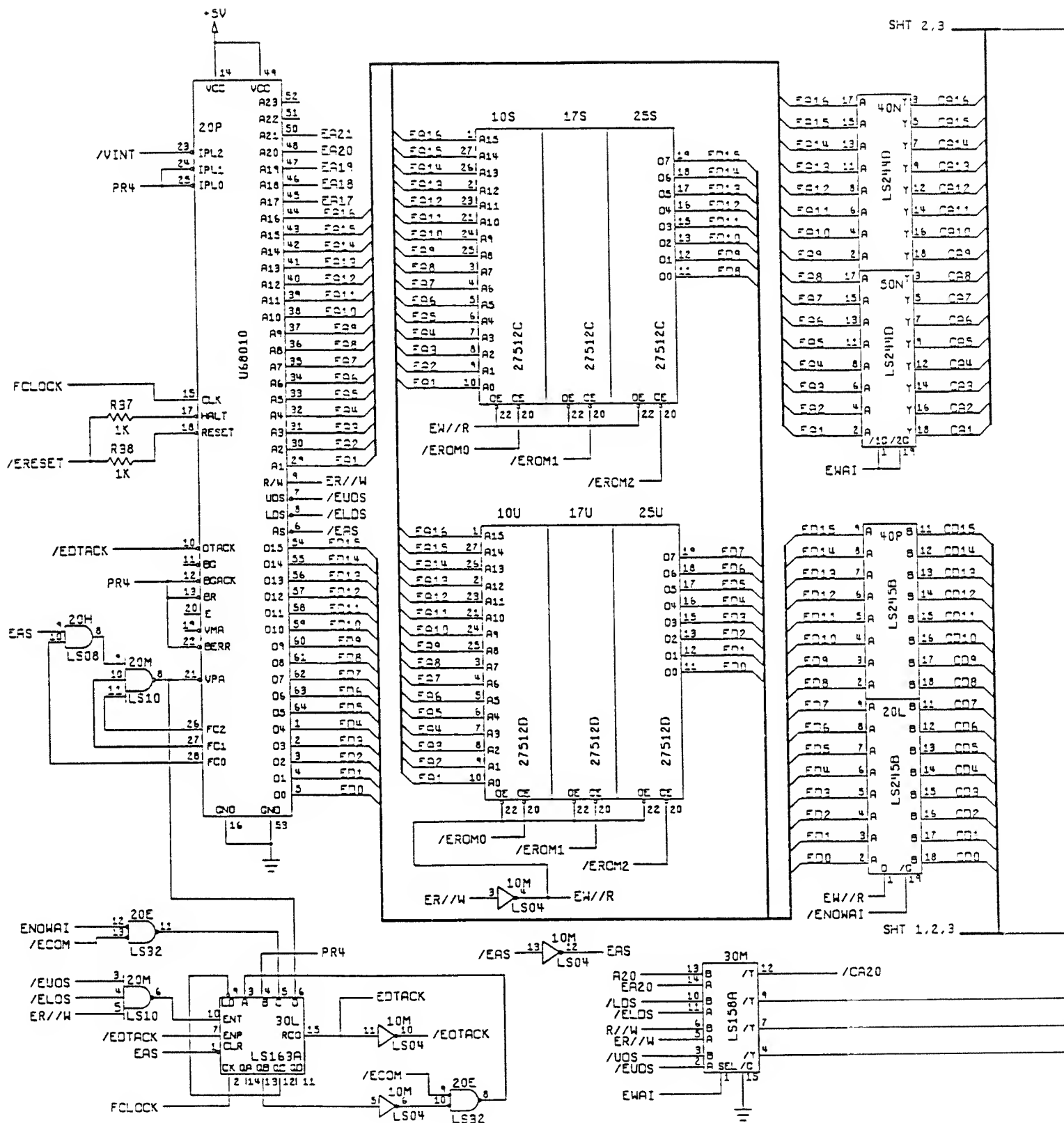




**Figure 5-1 Main PCB Assembly Schematic Diagram,
Sheet 2 of 9**

A046145-01 E





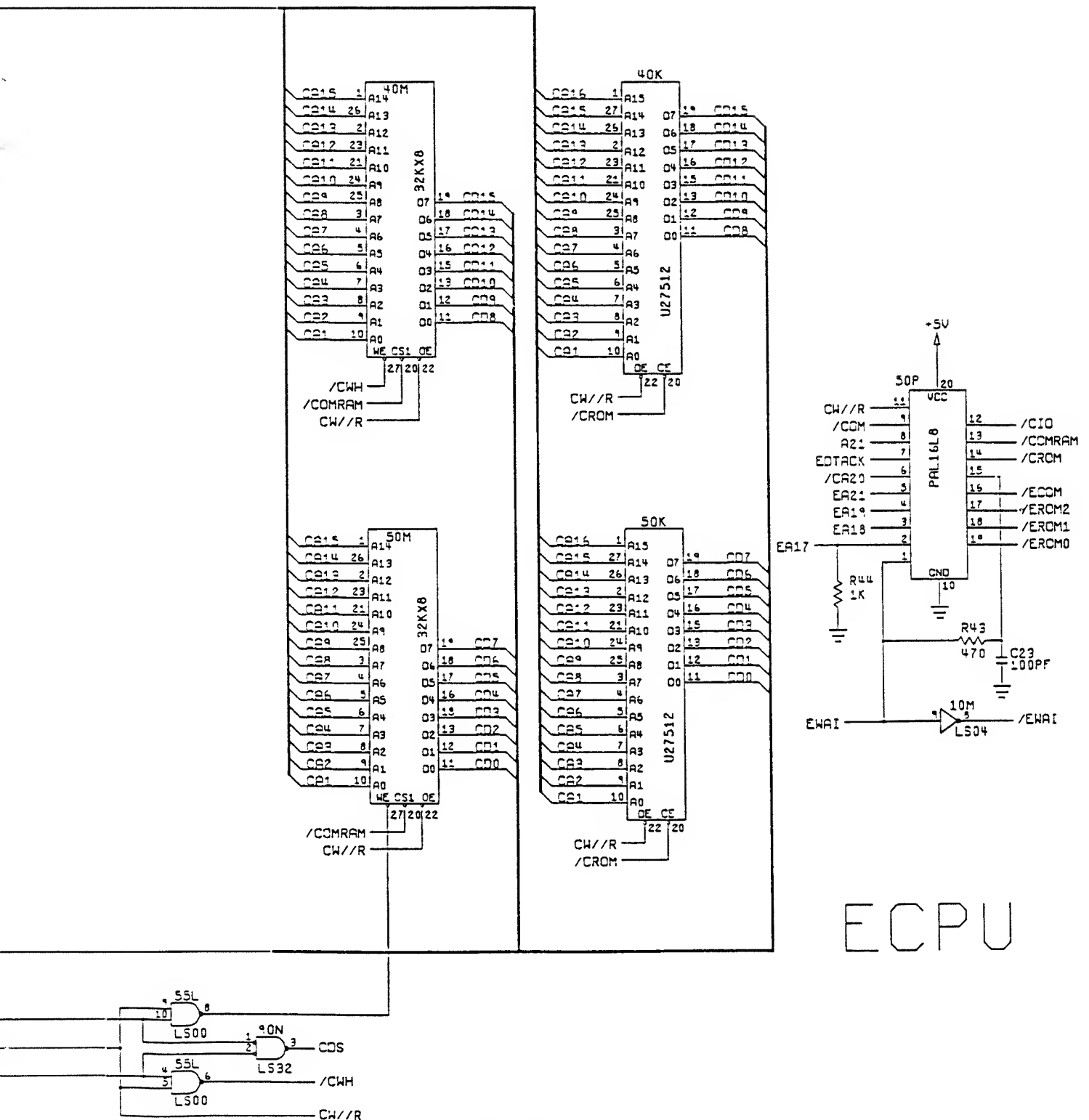


Figure 5-1 Main PCB Assembly Schematic Diagram,
Sheet 4 of 9

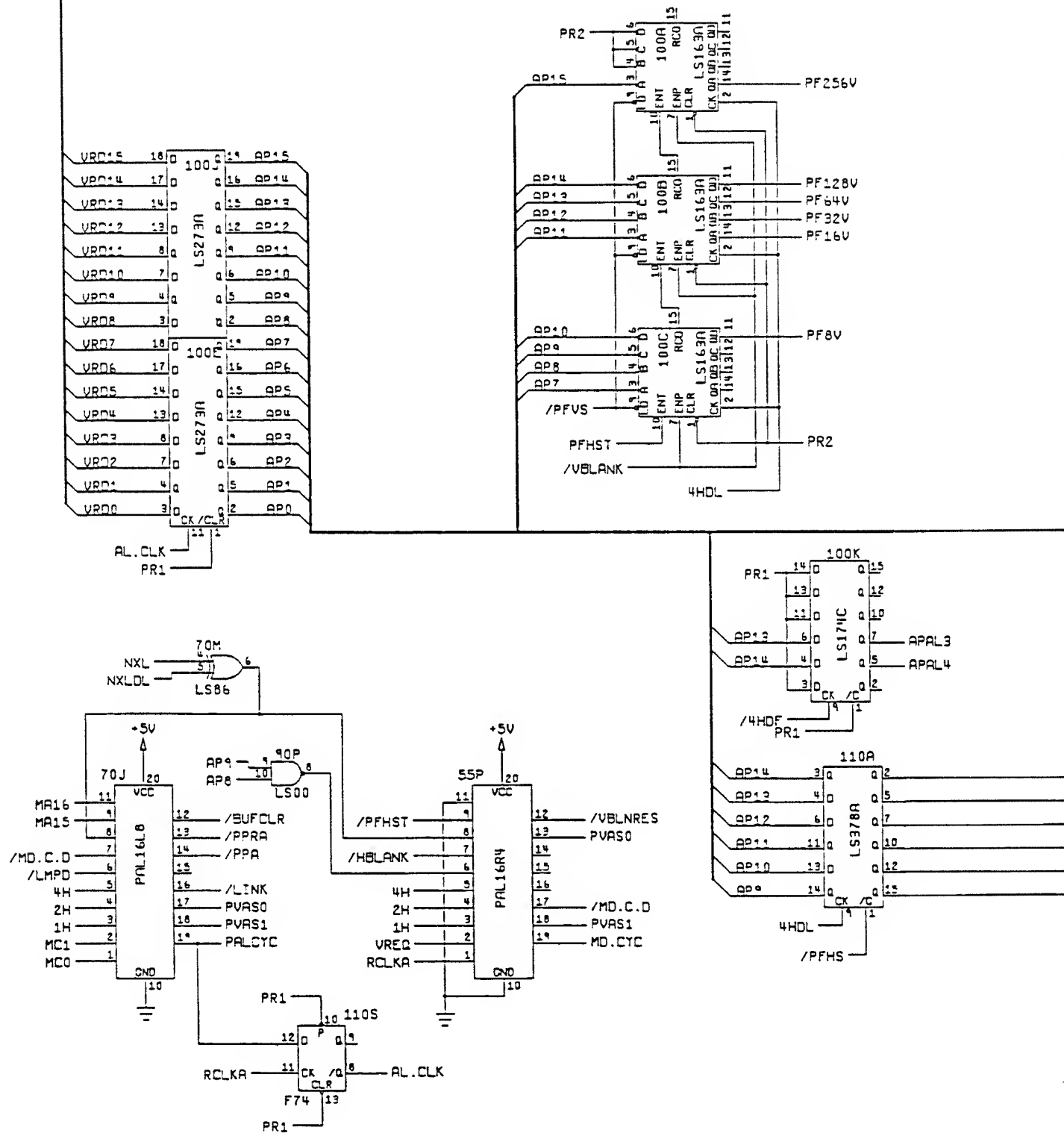
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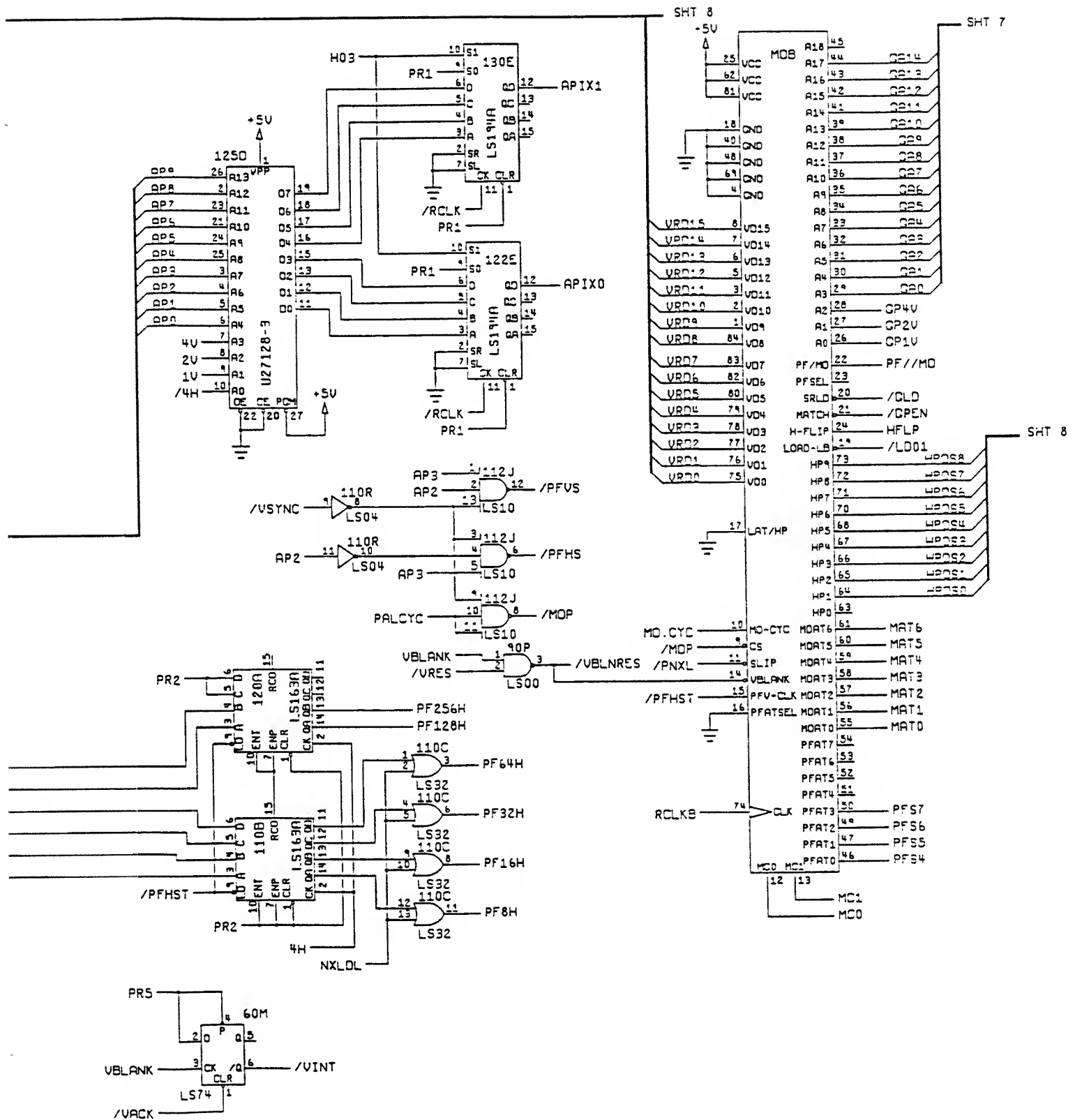
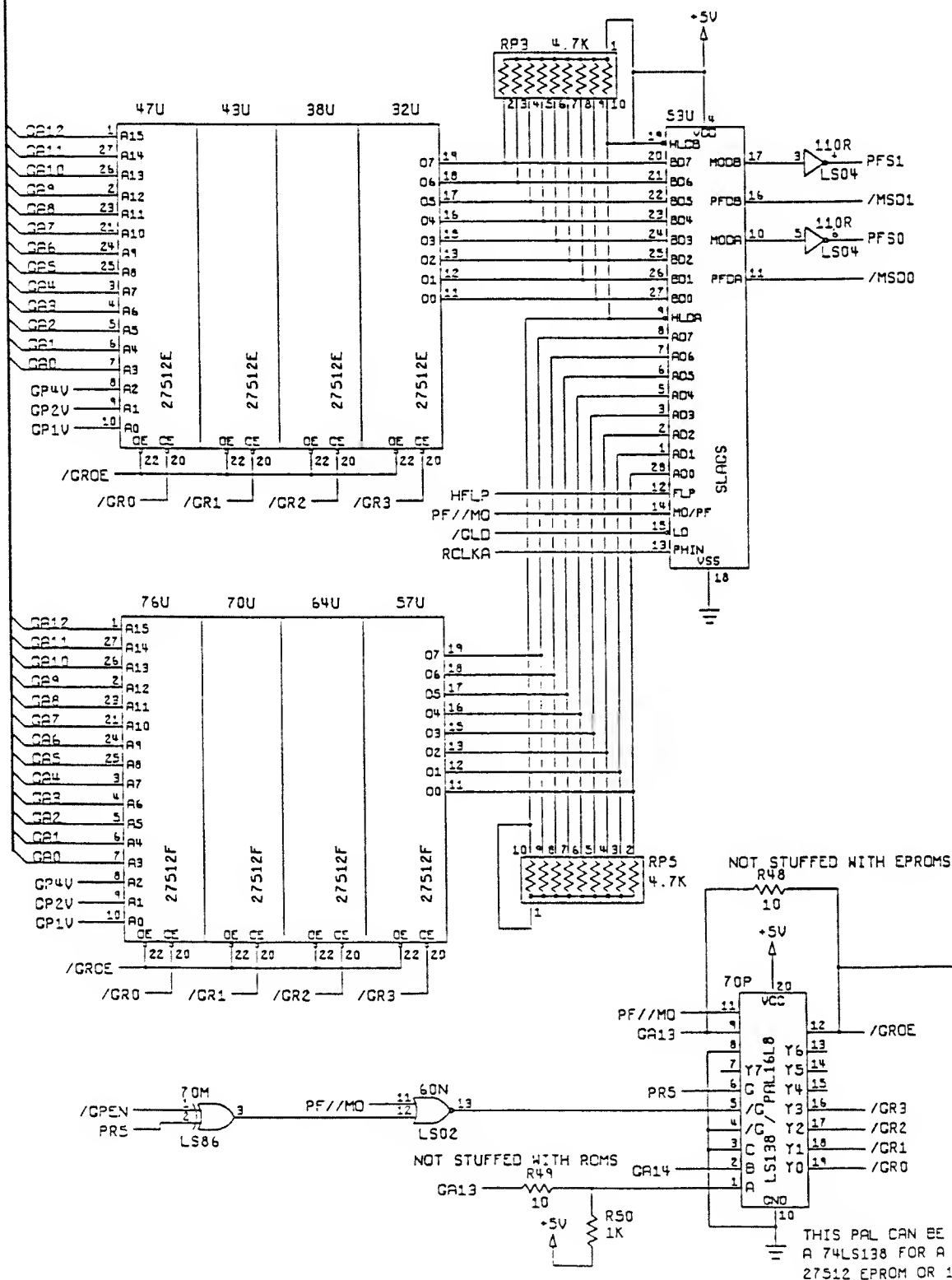


Figure 5-1 Main PCB Assembly Schematic Diagram,
Sheet 6 of 9

A046145-01 E

SHT 6



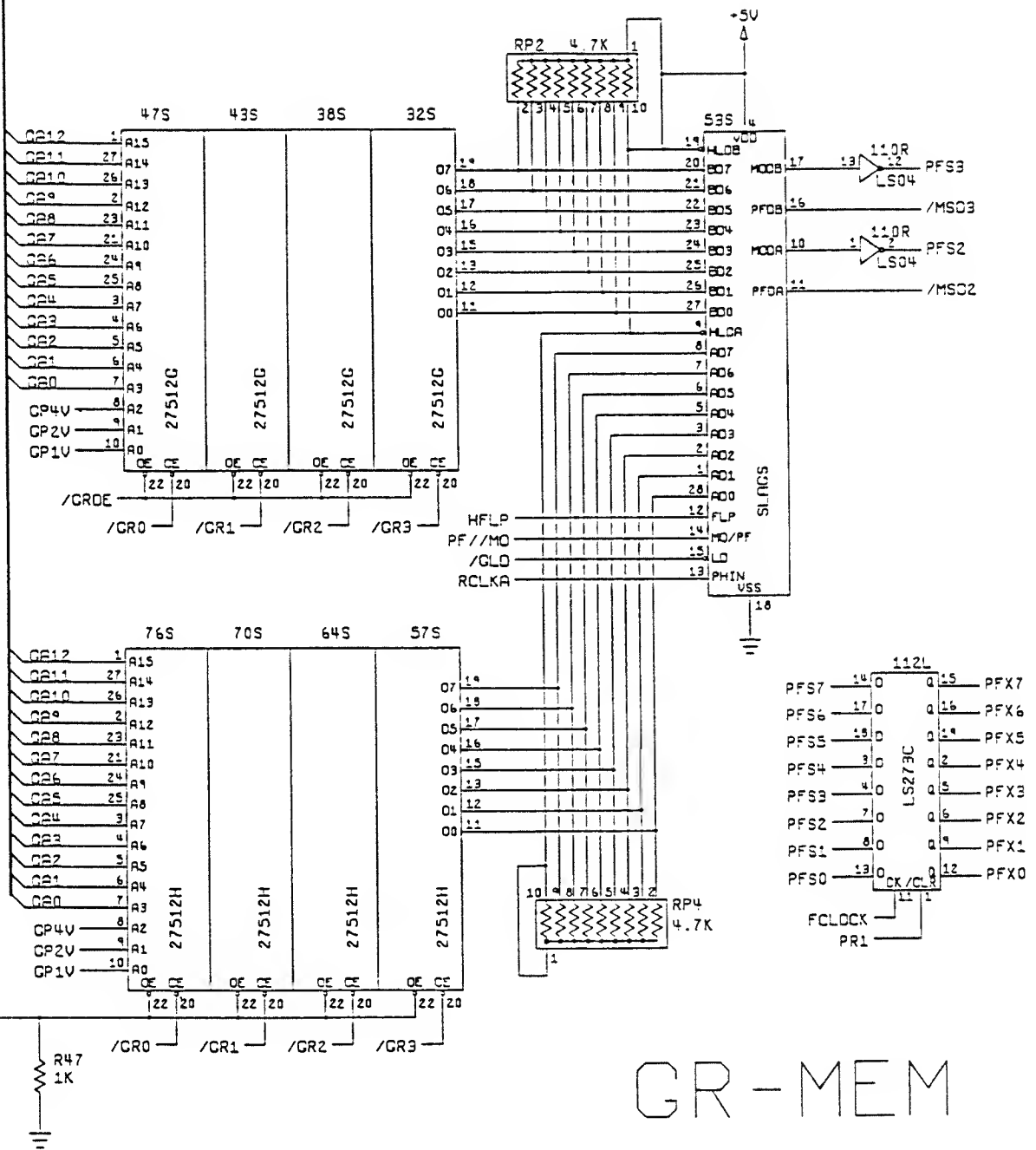
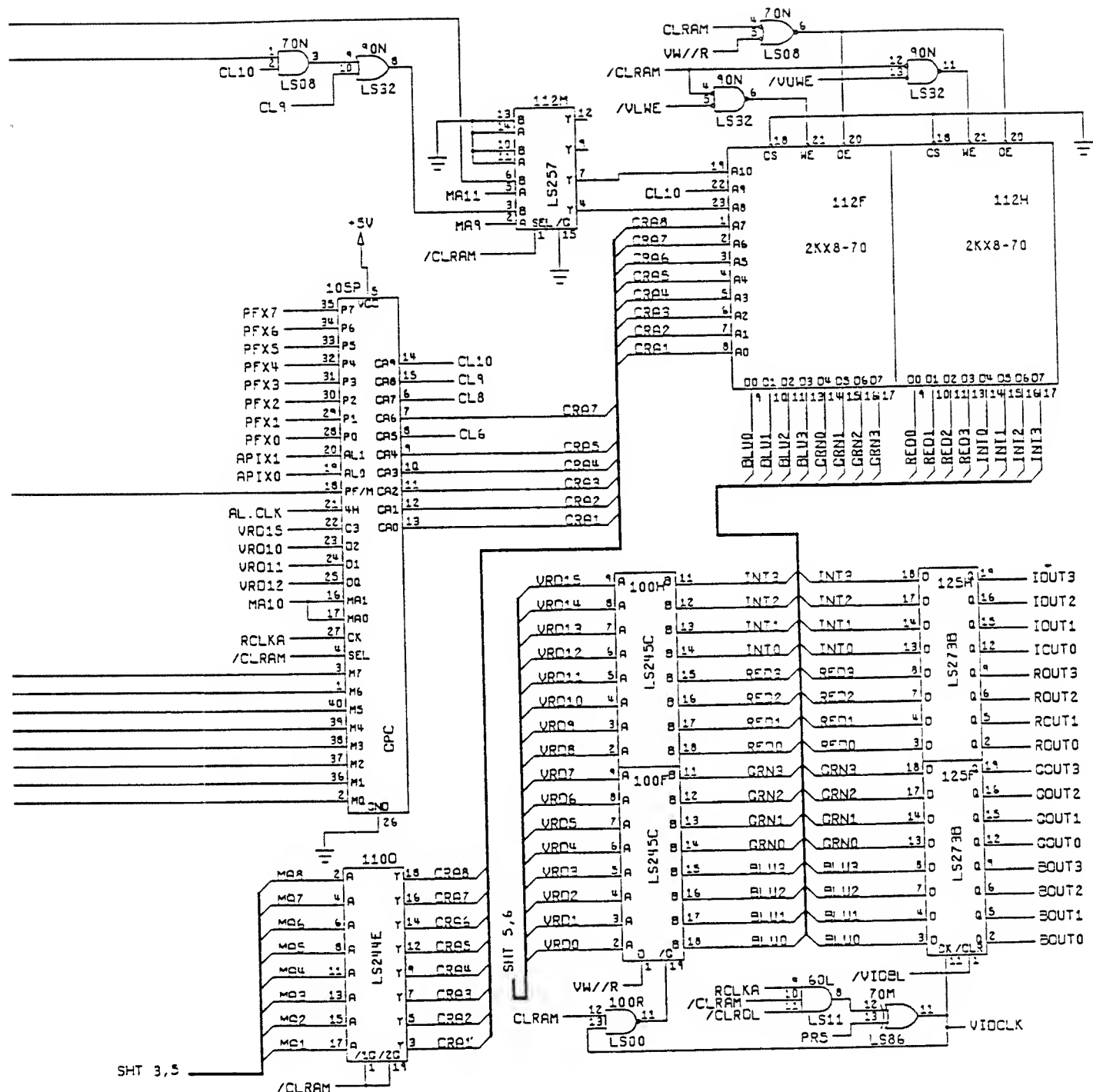


Figure 5-1 Main PCB Assembly Schematic Diagram,
Sheet 7 of 9

A046145-01 E



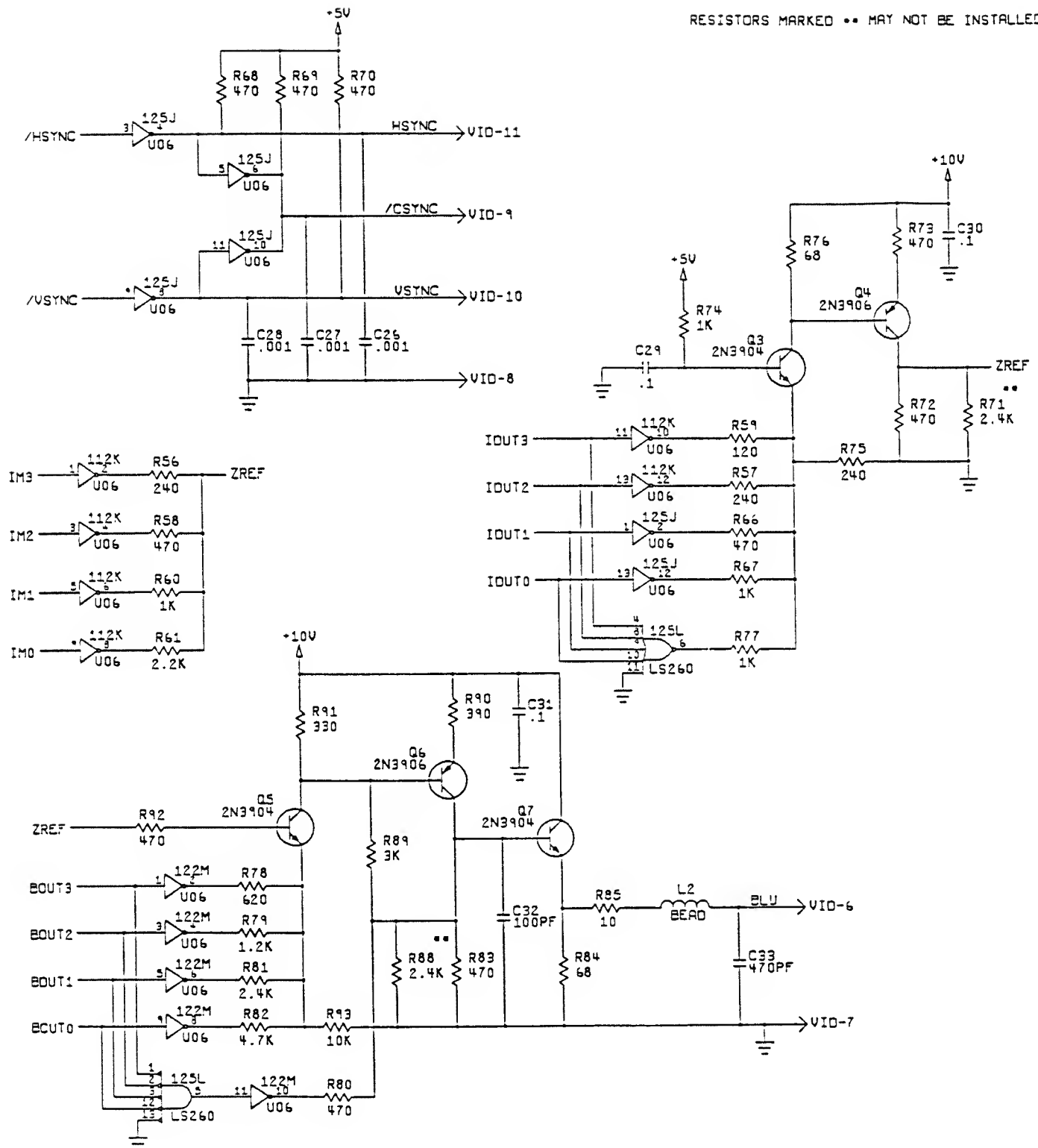


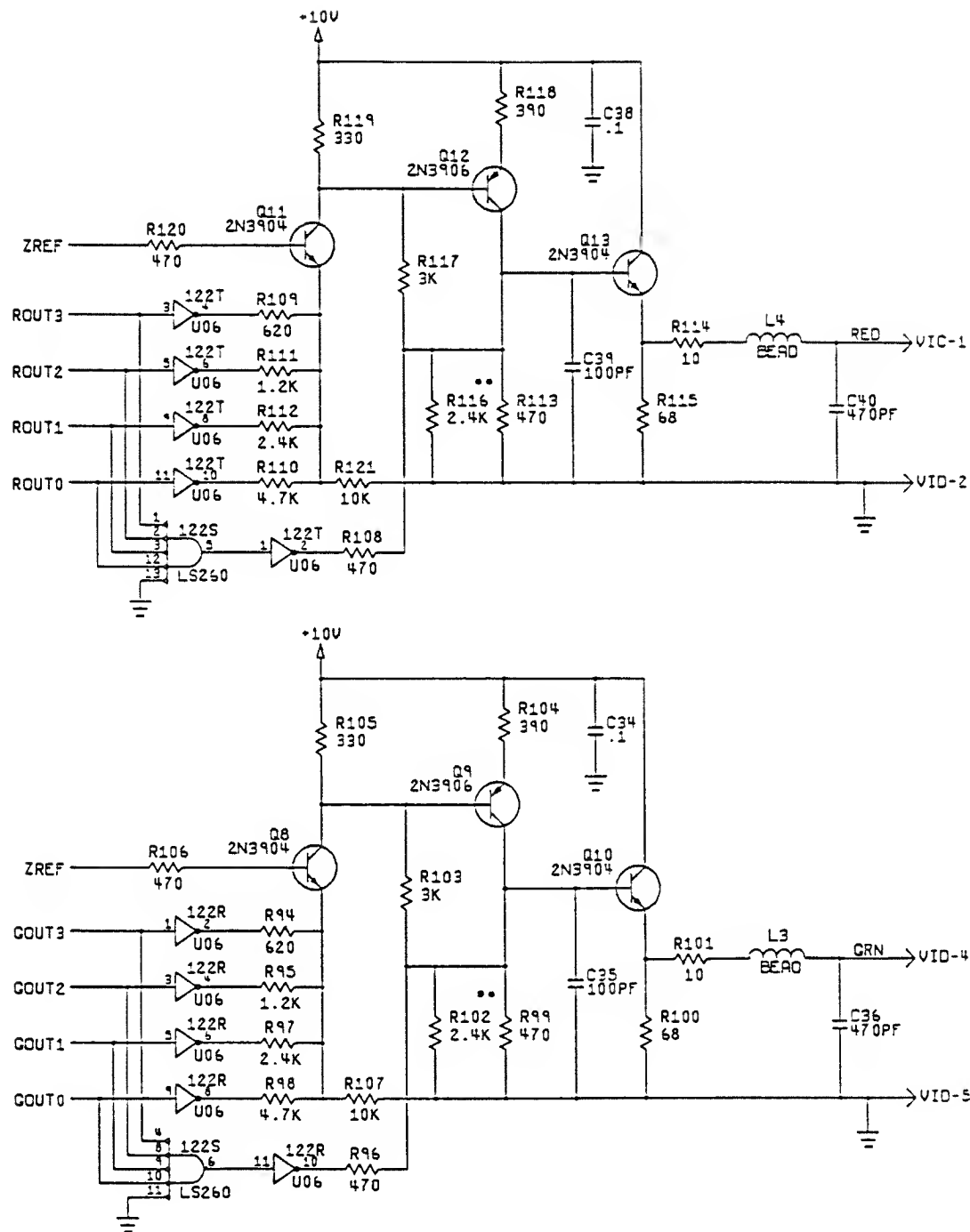
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Figure 5-1 Main PCB Assembly Schematic Diagram,
Sheet 8 of 9

A046145-01 E

RESISTORS MARKED ** MAY NOT BE INSTALLED.

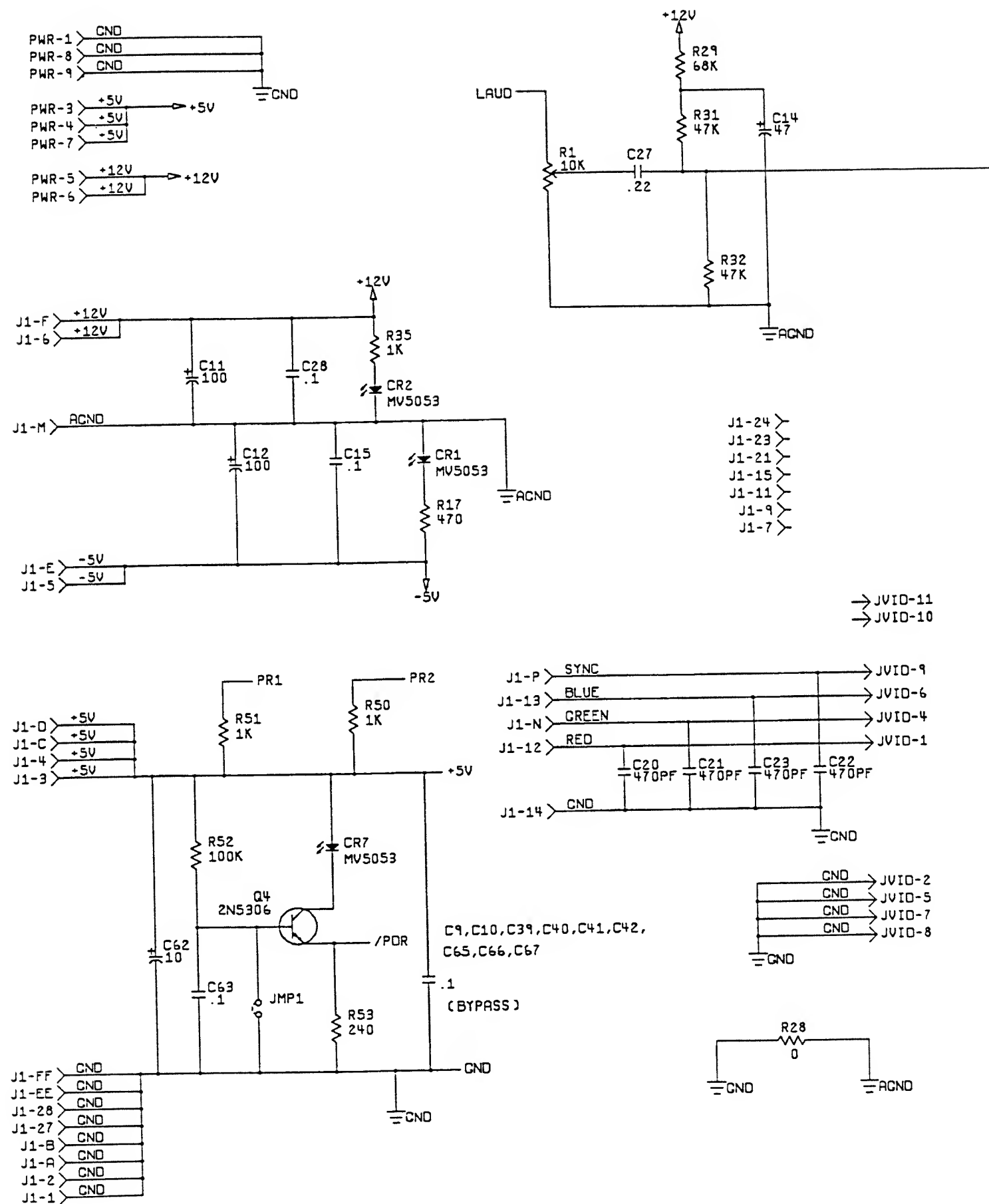


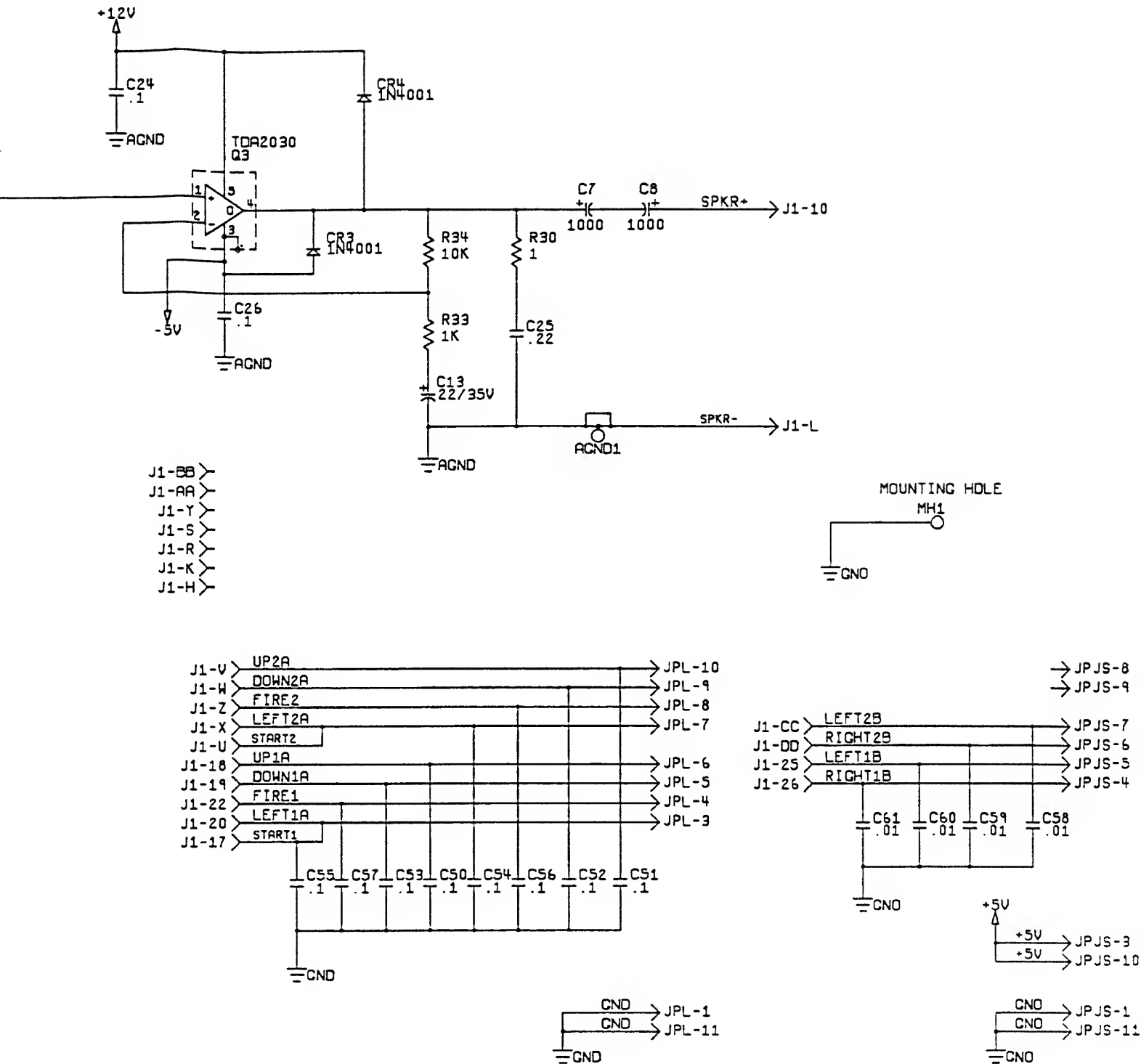


RGB

**Figure 5-1 Main PCB Assembly Schematic Diagram,
Sheet 9 of 9**

A046145-01 E





**Figure 5-2 JSA Audio PCB Assembly Schematic Diagram,
Sheet 1 of 4**

A047069-01 A



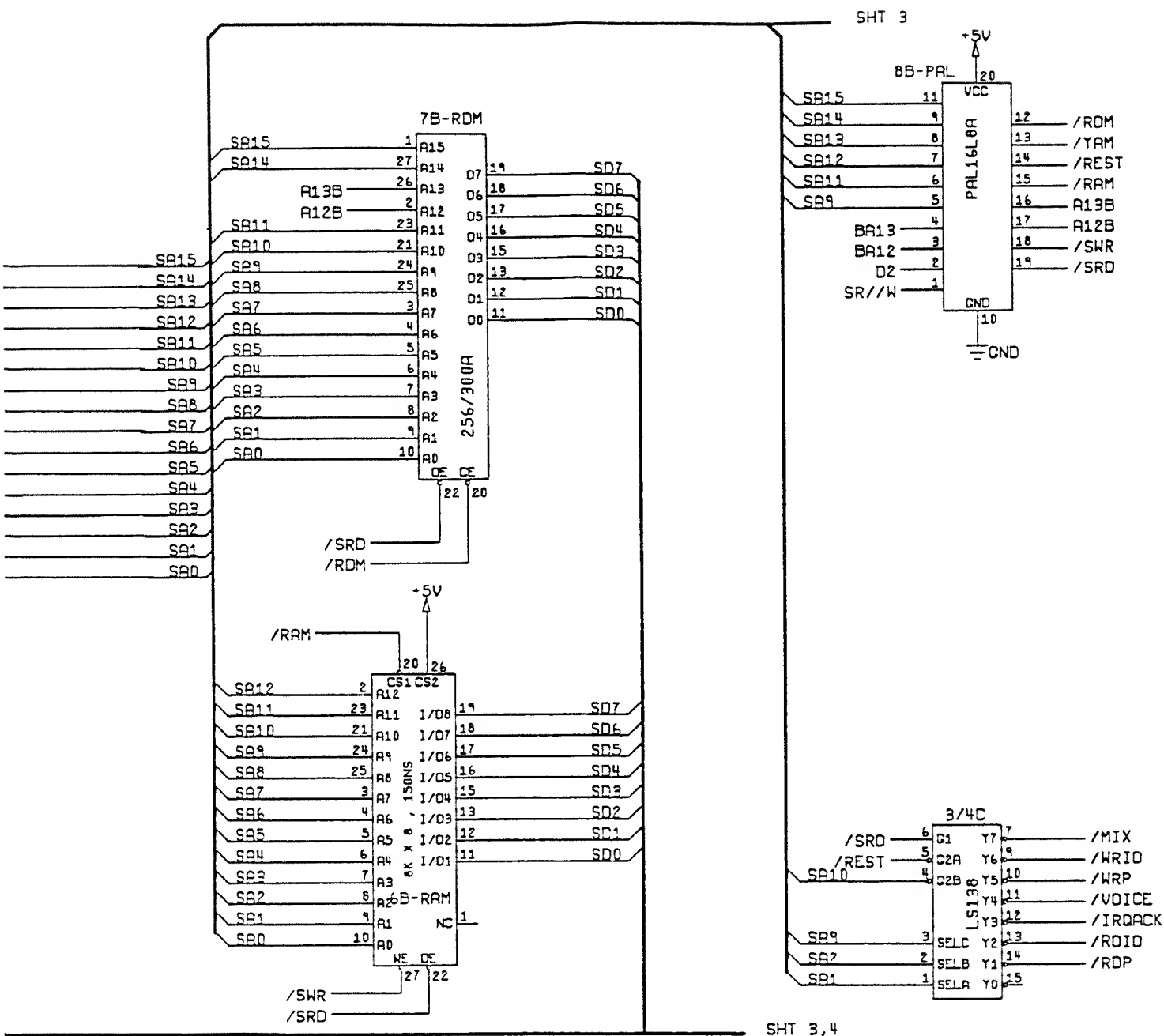
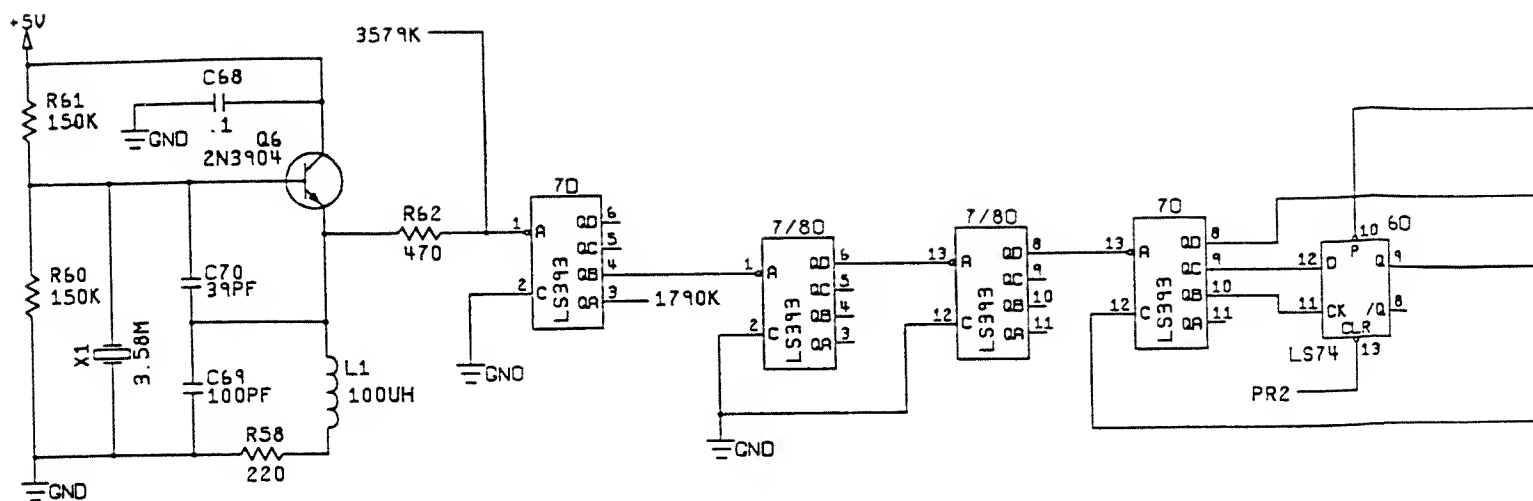


Figure 5-2 JSA Audio PCB Assembly Schematic Diagram,
Sheet 2 of 4

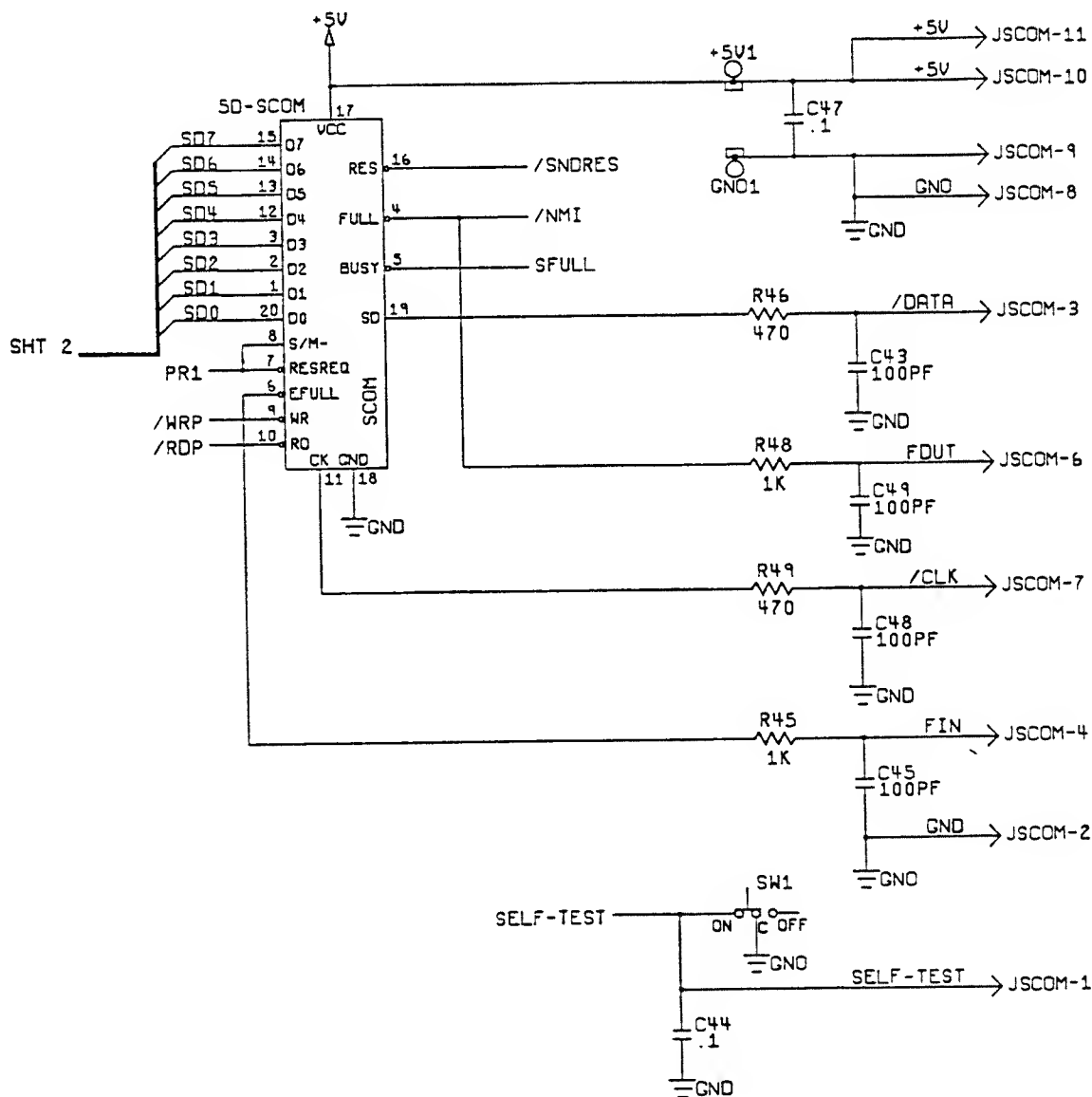
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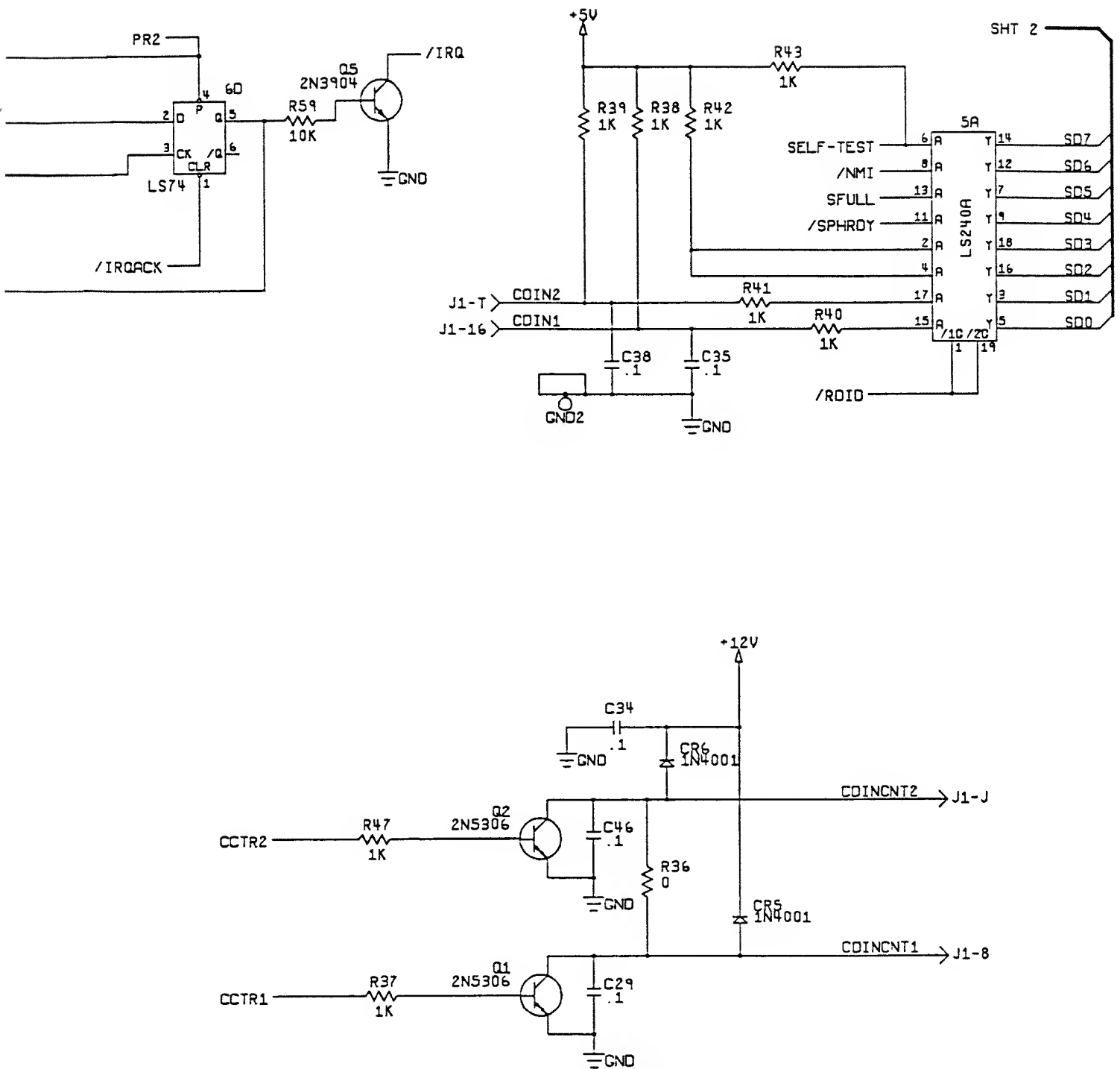






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**Figure 5-2 JSA Audio PCB Assembly Schematic Diagram,
Sheet 4 of 4**

A047069-01 A

Escape Main PCB Memory Map

Video CPU Memory Map

All addresses can be accessed in byte or word mode.

Type	Address	R/W	Data
Program ROM	000000-05FFFF	R	D15-D0
	060000-07FFFF	(See common memory map below)	
Program ROM	080000-09FFFF	R	D15-D0
EEPROM	0E0001-0E2FFF	R/W	D7-D0
	160000-17FFFF	(See common memory map below)	
UNLOCK EEPROM	1Fxxxx	W	
	260000-260030	(See common memory map below)	
Watch Dog	2E0000	W	xx (128 msec. timeout)
	360000-360030	(See common memory map below)	
Color RAM Alpha	3E0000-3E01FF	R/W	D15-D0
Color RAM spare	3E0080-3E00FF		
Color RAM spare	3E0180-3E01FF		
Color RAM Motion Object	3E0200-3E03FF	R/W	D15-D0
Color RAM Playfield	3E0400-3E05FF	R/W	D15-D0
Color RAM Playfield Shadow	3E0600-3E07FF	R/W	D15-D0
Color RAM STAIN	3E0800-3E0FFF	R/W	D15-D0
Playfield picture RAM	3F0000-3F1FFF	R/W	D15-D0
Motion Object RAM	3F2000-3F3FFF	R/W	D15-D0
(Link, Picture, H-Pos, V-Pos, Link, etc.)			
AlphaNumerics RAM	3F4000-3F4EFF	R/W	D15-D0
Scroll and MOB config	3F4F00-3F4F7F	R/W	D15-D0
SLIP pointers	3F4F80-3F4FFF	R/W	D9-D0 M.O. link pointers
Working RAM	3F5000-3F7FFF	R/W	D15-D0
Playfield palette RAM	3F8000-3F9FFF	R/W	D11-D8

Extra CPU Memory Map

Type	Address	R/W	Data
Program ROM	000000-05FFFF	R	D15-D0
	060000-360030	(See common memory map below)	

Common Memory Map

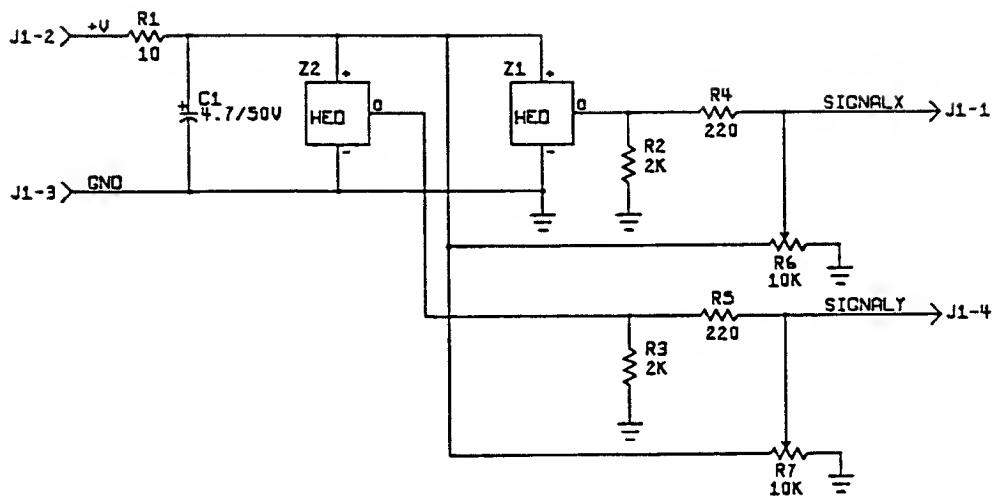
Both processors use the same addresses to access this information.

Type	Address	R/W	Data
Program ROM	060000-07FFFF	R	D15-D0
Program RAM	160000-16FFFF	R/W	D15-D0

I/O

All the I/O is decoded in word mode only.

Player 1 Input	260000	R	D8-D11	
Player 2 Input	260010	R	D8-D11	
			D11	duck
			D10	spare
			D9	fire
			D8	start
VBLANK	260010	R	D0	Active lo
Self-test	260010	R	D1	Active lo
Input-buffer Full (@ 260030)	260010	R	D2	Active lo
Output-Buffer Full (@ 260030)	260010	R	D3	Active lo
ADEOC, end of conversion	260010	R	D4	ACTICE hi
ADC 0 ANALOG PORT	260020	R	D0-D7	
ADC 1	260022	R	D0-D7	
ADC 2	260024	R	D0-D7	
ADC 3	260026	R	D0-D7	
Read Sound Processor (SCOM)	260030	R	D0-D7	
Vblank Interrupt ack.	360000	W	xx	
LATCH	Video Off	360010	W	D5 0=on
	Video Intensity	360010	W	D4-D1 0=full on
	EXTRA cpu reset	360010	W	D0 Lo to reset
Sound Processor Reset	360020	W	xx	
Write Sound Processor (SCOM)	360030	W	D0-D7	



Hall-Effect Joystick Schematic Diagram

Figure 5-3 Memory Map, Hall-Effect Joystick Schematic Diagram

A046516-01 A



Escape From the Planet of the Robot Monsters™

Statistics Sheet

Statistics Screen

Plyr 0 Coins:	_____	1 Plyr Mins:	_____	Error Count:	_____
Plyr 1 Coins:	_____	2 Plyr Mins:	_____	Total Coins:	_____
Total Games	_____	L Plyr Mins:	_____	Avg Time/Coin:	_____
0 Plyr Mins:	_____	R Plyr Mins:	_____		

Histogram Screens

Histogram 1 New Game		Histogram 2 Continuations		Histogram 3 Level Quit At		Histogram 4 Deaths Per Level	
0- 59	_____	0- 59	_____	0	_____	0	_____
60- 89	_____	60- 89	_____	1	_____	1	_____
90-119	_____	90-119	_____	2	_____	2	_____
120-149	_____	120-149	_____	3	_____	3	_____
150-179	_____	150-179	_____	4	_____	4	_____
180-209	_____	180-209	_____	5	_____	5	_____
210-239	_____	210-239	_____	6	_____	6	_____
240-269	_____	240-269	_____	7	_____	7	_____
270-299	_____	270-299	_____	8	_____	8	_____
300-329	_____	300-329	_____	9	_____	9	_____
330-359	_____	330-359	_____	10	_____	10	_____
360-389	_____	360-389	_____	11	_____	11	_____
390-419	_____	390-419	_____	12	_____	12	_____
420-449	_____	420-449	_____	13	_____	13	_____
450-479	_____	450-479	_____	14	_____	14	_____
480-509	_____	480-509	_____	15	_____	15	_____
510-539	_____	510-539	_____	16	_____	16	_____
540-569	_____	540-569	_____	17	_____	17	_____
570-599	_____	570-599	_____	18	_____	18	_____
600 & up	_____	600 & up	_____	19 & up	_____	19 & up	_____

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- (b) Such products are returned prepaid to Seller's plant; and
- (c) Seller's examination of said products discloses to Seller's satisfaction that such alleged defects existed and were not caused by accident, misuse, neglect, alteration, improper repair, installation, or improper testing.

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Atari Games Corporation

675 Sycamore Drive

P.O. Box 361110

Milpitas, CA 95035